THE MATERNITY WARD AT ST. THOMAS'S HOSPITAL, LONDON, AND ITS WORK DURING 1911.

BY

JOHN S. FAIRBAIRN, M.A., B.M.OXON.,

AND

JAMES M. WYATT, M.B.LOND.

A WARD, named "Mary" after Her Majesty the Queen, was opened in St. Thomas's Hospital for the reception of lying-in patients in October, 1910, and the report of the work done there during the year 1911 has just been completed. It seemed to us that this was a suitable occasion to give an account of the ward and its work.

As the conversion of a large 28-bed ward into a small lying-in hospital is a problem which presents many difficulties, we have thought it would be of interest to describe in detail the alterations and furnishing of this small hospital within a hospital, and we also purpose giving a sketch of the way in which the ward has been brought into the teaching work of the hospital in accordance with the recent recommendations of the General Medical Council as adopted by the Universities of Oxford and Cambridge.

Even before the committee of the General Medical Council had issued its report on the teaching of obstetrics the opening of a ward for lying-in patients had been before the minds of the staff and governors. The late Dr. Cullingworth had urged the advantages to the hospital and medical school which such a ward would bring, and largely through his representations the governors decided to convert one of the wards of St. Thomas's Home into a maternity ward after the removal of the Home from the charitable part of the hospital. This, however, did not take place till some time after Dr. Cullingworth had retired from the staff, and though he knew that the governors had decided to carry out the project he had so strongly advocated he did not live to see its realization.

If a ward of this kind is to take an important place in the training of students a number of beds sufficient to allow of a steady supply of cases is essential. One delivery a day was taken as the average to be aimed at, and it was calculated that 20 beds would give this. Reckoning the stay of each patient at an average of 14 days, it would mean 40 patients a month if the ward were worked continuously at its full capacity. This, however, is obviously impossible with maternity cases, and hence not more than 15 of the 20 beds could be looked on as in constant use, thus giving 30 deliveries a month, or about 1 a day. It will be seen that the actual number of confinements in 1911 was 364.

The ward selected was not one of the Home wards, but the ward at the top of No. 2 block (formerly Florence Ward), as it is further from the main corridors and more isolated than the old Home wards lower down. Having in mind the lying-in hospital system of small wards of 8 to 10 beds which are emptied and cleaned after each batch of patients, various plans of subdividing the ward into separate units were considered, but none were found practicable. It was impossible without interfering with the lighting and cross-ventilation to cut off wards which could be closed and worked separately with convenient access to the sanitary offices at the river end of the ward. Under modern conditions closing the wards for disinfection after each batch of patients seemed no longer as essential as in former days, and it was felt that there ought to be no difficulty in keeping a lying-in ward in continuous service—like an ordinary surgical ward—and accommodating as many as 20 patients at a time.

When once this point was decided the rearrangement became comparatively simple. The ward was 120 ft. long by 28 ft. wide, with a sanitary annexe at each angle of the river end, and on the stair landing at the entrance of the ward was the following accommodation: (1) Sister's sitting-room, (2) small clinical room for urine-testing, etc., (3) a linen room, (4) small ward, (5) kitchen.

The only alteration that was made in the rooms at the entrance was that the kitchen, being larger than the small ward, was converted into a receiving-room and the kitchen was transferred across the corridor to what was the s ward. The receiving-room, as modified, has a floor sp... of 224 sq. ft., including portions cut off for a cupboard for patients' clothing and a w.c., and is floored with terrazzo mosaic cored to the wall and channelled to take the waste of the bath and sink. The walls are lined to the height of 6 ft., with 6 in. cream tiles with green borders, and the upper portion finished in Parian cement and painted with Gay's enamel. It contains a white enamel bath on wheels, an earthenware sink fixed on cantilevers set clear of the walls, and a bedpan sink fitted with elbow-action taps, placed here for emergency use in case of the large labour room being used for lying-in patients when the ordinary sink room is unapproachable during the cleaning of the main ward. The only furniture in the room is an examination couch and a few screens. Patients on arrival at the hospital are not seen in the casualty like ordinary patients but are sent straight up in the lift to the receiving-room. There they are examined, and if in labour or to be admitted to the ward, are given a bath, put into hospital clothes, and sent to the labour room or to the ward as their condition requires. This room is also used occasionally for the examination of advice-patients who may come for measurement or determination of the time for induction and such like.

On passing through the swing doors that give entrance to the ward, the alterations shown in the accompanying plan are seen to be really no more than the cutting off from the main ward of a large and a small labour-room and a baby-room or nursery, leaving the remainder as the lying-in ward.

The new dividing walls which run from floor to roof were built of Shepwood hollow bricks, 12 by 6 by 2 in., with keyed face for the plaster. They were set and plastered in Portland cement, and lined on the room side with tiles like those in the receiving-room to a height of 6 ft. Above this and on the side towards the ward they were finished in Parian cement and painted with Gay's enamel. These partition walls cut off from the ward on the left a small labour-room with a floor space of 220 sq. ft. and a large labour-room of 476 sq. ft., and on the right a small nursery for babies of 143 sq. ft. Each of these rooms is fitted with a slow combustion grate with a fire-brick bottom, rounded metal kerbs, and raised tile hearth, and the large labour room has in addition a hot water coil. The floors of these rooms are laid with euboeolith patent flooring moulded to the walls to prevent damage from the beds. In each labour-room are two white enamel sinks, fixed on cantilevers standing clear of the walls and discharging into channels on the floor. Over the sinks are marmorite shelves 1 in. thick, with rounded corners, fixed on cantilevers and set clear of the walls. These carry jars, lotion bottles, etc. Aluminium shelves carry the sterilizers for instruments and boilers. There is one bed in the small and two in the large labour-room. These are of the Lawson Tait pattern, made of tube steel throughout, with a detachable headpiece and a patent castor attachment which can be thrown out of use when not required. They are 6 ft. 6 in. long and 3 ft. wide and 2 ft. 4 in. high, and are fitted with a zinc plate cover to form a lying space. The large labour-room also contains the instrument cupboard and an operating table. The nursery contains a double babies' bath, consisting of an enamelled iron top 3 ft. 8 in. by 3 ft. 3 in., with two oval-shaped basins 2 ft. 2 in. by 1 ft. 3 in. by 9 in. deep, with hot and cold taps between the basins to serve both. The whole is fixed on an enamelled iron stand 2 ft. 2 in. from the floor, the most convenient height for a nurse to sit at, with a knee-action waste to discharge to a channel on the floor. There is a hot coil by the side of the bath, and the only furnishing is a weighing machine and a small cupboard in the wall fitted with pigeon-holes, numbered for each cot, to contain the washing materials for each baby.

The ward, after these three rooms have been cut off, is somewhat L-shaped and accommodates 20 beds between the windows. The ward floor is polished oak boards, and the walls are plastered and painted with Gay's patent enamel. Originally there were three fireplaces down the centre of the ward supplied with fresh air from the outside by ducts below the floor, and with a ventilating air shaft at the ceiling. The wall cutting off the large labour-room includes one of these fireplaces and shafts, and the gra...

has been altered so as to give one fireplace in the labour-room and one in the ward. Besides the two remaining fireplaces there are two large hot-water radiators down the middle of the ward, and also a large white enamelled sink (as shown in the plan). The ward bedsteads are like those in the labour-room, except that they are without the zinc cover and have a wire spring mattress and ordinary castors; at each end of the foot are detachable standards which can be arranged to carry the cots. The cots are of wire caging, with a flat bottom, so that they rest on the floor. In the ward are also a number of collapsible stands in which the cot can be swung when in the nursery. The bedsteads were specially designed, and, having an increased height, stays are provided from leg to leg, practically forming a double frame. As they have large rubber castors, each bedstead is a perfect ambulance.

At the river end of the ward is a door opening on to the balcony (which commands a magnificent view of Westminster and the north of the river) and on each side are doors leading on the left to the sanitary annexe and on the right to the isolation ward. Each annexe is cut off from the main ward by a short corridor with cross ventilation. The isolation room is 196 sq. ft., and is floored with terrazzo mosaic cored to the walls, which are rendered in Parian cement and finished with Gay's enamel. It has no fireplace, and is heated by two large hot-water radiators, and contains a sink with tiles to the wall at its back. This room is used chiefly for cases that require special nursing, such as cases of eclampsia after delivery, and other toxic cases. Suspected septic cases are also placed there, but usually for not more than twenty-four hours, as directly the diagnosis is confirmed they are sent to the special wards in the hospital kept for infective cases.

The sanitary annexe is also laid with terrazzo mosaic, and is channelled for the sink and bath waste. It contains three earthenware sinks fixed like the others on cantilevers clear of the walls. These sinks are 3 ft. 6 in. by 1 ft. 9 in. and 8 in. deep (in one the depth is 12 in.), and are used in the following way: The first one is the patient's washing sink, the next is used for washing basins and utensils, and the third is a mackintosh sink, and is also used for soiled linen, and is fitted with a wringer. Fitted to its side is a mackintosh table for scrubbing mackintoshes. There is a bedpan sink fitted with elbow action taps, and a white enamel bath on wheels, which discharges to the channel on the floor. The watercloset is cut off by a wood partition 7 ft. high. It is heated by a hot-water radiator above, which is an aluminium rack for bedpans, the hot-water pipes forming the bottom shelf for these pans. The one other item of interest in this annexe is the specimen cupboard, which is fitted into the wall above the sink, and is arranged like a larder with perforated zinc outside, and glass doors in iron frames inside; it is lined with marmorite and fitted with marmorite shelves. It is used for keeping placentae, dressings, and specimens of any kind that may be wanted for inspection or demonstration.

The sterilization of dressings, towels, gowns, etc., being carried out in the hospital basement, as for the rest of the hospital, no provision was necessary for this.

The majority of patients are selected for admission to the ward by the house-officer, preference being given to primigravidae and those in whom some difficulty and complication might be expected. Many are recommended to the house-officer by the lady almoner's department, either because their home conditions in the district are unsuitable, or as deserving cases from outside the area covered by the charity. Great care is taken to avoid abuse, and personal visits are made to the homes in the great majority of cases. Included among these cases are patients with a previous history of difficult or complicated labour and patients referred from the medical and surgical side. Indeed, a striking difference between the patients in Mary Ward and in a lying-in hospital is the greater percentage with renal, cardiac, and pulmonary complications, as might be expected from the association with a large general hospital. For instance, there have been patients with such medical complications as pneumonia, acute rheumatism, pericarditis, and so on, and surgical complications ranging from sarcoma of the jaw to fractured limbs. Besides these there are the emergencies taken in from the district or sent in by doctors because of some serious complication.

Fig. 1.—Lying-in Ward.

Instruction of Students.

We now wish to explain how the ward has been brought into the clinical teaching of the hospital, and as the obstetrical and gynaecological work is carried on together it will be as well to mention that the combined departments are officered by three visiting physicians, a tutor and registrar, and two house-officers. Every student, after completing his medical and surgical ward work, serves a term of three months in this department,

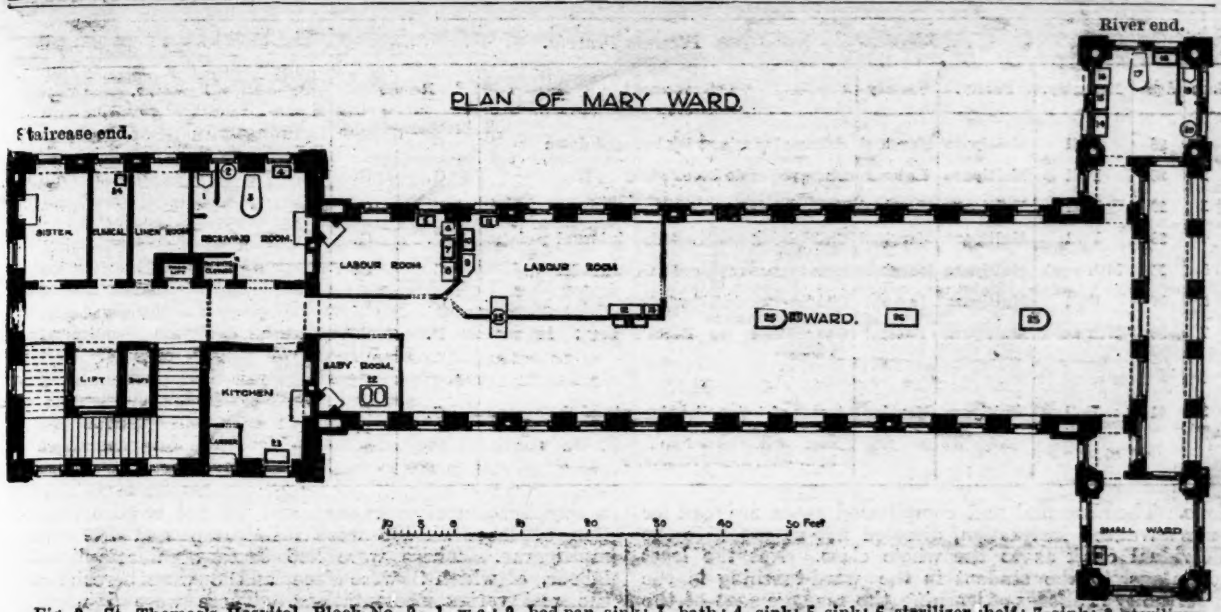

Fig. 2.—St. Thomas's Hospital, Block No. 2. 1, w.c.; 2, bed-pan sink; 3, bath; 4, sink; 5, sink; 6, sterilizer shelf; 7, sink; 8, sterilizer shelf; 9, marmorite shelf; 10, sink; 11, sink; 12, radiator, with sterilizer shelf; 13, sterilizer shelf; 14, sink; 15, sink; 16, draining board; 17, bath; 18, mackintosh sink; 19, w.c.; 20, bed-pan sink; 21, sink; 22, baby bath; 23, sink; 24, sink; 25, stove; 26, radiator.

his time being apportioned so that he spends seven weeks at gynaecology and six at obstetrics—that is, four as obstetric clerk in the ward and two on the district. This system of combining the work we look on as one of great importance, as in this way the difficulty of occupying the students' time while waiting for his indoor cases is largely obviated. As long a time as three days have elapsed without a birth in the maternity ward, and, again, as many as 7 births have occurred within three hours. To make up for this irregularity the student, when not required in the maternity ward, is expected to attend clinical instruction in the gynaecological ward or out-patient department. In this way he can fill in five afternoons and one morning, and, though not acting as clerk or examining cases, he receives clinical instruction. Besides his attendance in the labour-room he has to visit his patients in the lying-in ward and write his case records and, on two mornings a week, assist the house-officer in the examination of patients applying for admission to the maternity ward and be present at the two official visits of the physician to the ward, so that there need be no question of his wasting his time. As a rule four men working in pairs are on duty as clerks in the maternity ward, to whom the cases are allotted in turn, the routine being the same as on the medical and surgical side. The instruction in the labour-room was at first a matter which seemed to offer some difficulty, as the visiting staff, living at a distance from the hospital, cannot see any but the abnormal cases and so cannot supervise the teaching on the ordinary run of cases. But this soon solves itself. The clerks are already drilled in the methods of surgical cleanliness and of ordinary medical examination, and the special work of the labour-room soon falls into a routine, which the student readily adopts.

One or other of the house-officers takes the clerk over most of his cases, and as, except at the commencement of each three months, the clerk has already witnessed many deliveries and learnt the routine, he does not require close supervision. Two members of the visiting staff and the obstetric tutor pay frequent visits to the labour-room and see that the clerk is carrying out the usual examination and management of the case. But the most important check on the student's work is found to be the official round of the lying-in ward when the clerk reads his account of the labour and is questioned on it; this involves listening to many rather tedious records of normal cases, but it gives a very good index of the way the work is being

Eclampsia.

Case.	Age.	Parity.	Urine.	Maturity.	Convulsions.	Treatment.	Result. Mother.	Result. Child.
1	19	Primipara	—	Full	Post partum, 8 or 10 fits; not delivered in hospital; comatose on admission	Venesection and infusion pulv. jalap. co., chloral, āā 3ij introduced by stomach tube; severe headache before commencement	D.	G.
2	20	Primipara	Solid on boiling	32nd week	Ante partum, 13 fits before delivery; 3 fits after delivery; comatose on admission	Venesection 3x; infusion 3xv; os dilated by de Seigneux's dilator; head perforated and delivered; after delivery infused three times with saline Ojss, but died 9 hours later	P.	S.
3	29	Multipara	Two-thirds albumen on boiling	Full	Post partum, 4 fits	Chloral gr. xxx, pot. brom. gr. xv, mag. sulph., sod. sulph. āā 3ij, intravenous saline Oij, inj. morph. hyp. mv; for a few days very irritable and had hallucinations, but these soon disappeared	G.	G.
4	23	Primipara	1 % Esbach	Full	Ante partum, 3 fits	Inj. morph. hyp. mxij in two doses; hot-air bath; labour induced with Champetier de Ribes's bag; normal delivery; 4 days later puerperal insanity; discharged to the infirmary	?	G.
5	37	Primipara	—	35th week	Ante partum, 8 fits	Light chloroform anaesthesia for 2½ hours, during which a toy bag was inserted and then a Champetier de Ribes's bag; then delivery with forceps; venesection 3viij, infusion Ojss; hot-air bath	D.	D.
6	33	Primipara	0.4 % Esbach	Full	Ante partum, 4 fits	CH$_4$ls, venesection 3xij, infusion Oijss, calomel gr. v, inj. morph. hyp. mv 4-hourly, 3 doses; hot-air baths; marked improvement; 4 days later induction with toy bag; low forceps	G.	D.
7	40	Multipara, 4th conf.	Solid on boiling	20th week	Ante partum, 20 fits.	Cervix dilated with Hegar's dilators; leg brought down and child delivered; venesection 3xij; infusion Oj, inj. morph. hyp. mv; this patient had eclampsia in her first two confinements	G.	D.

Placenta Praevia.

Case.	Age.	Maturity.	Parity.	Variety	Treatment.	Result		Remarks.
						Mother.	Child.	
1	26	Full	Multipara	Marginal	External version; leg brought down	G.	D.	
2	25	Full	Multipara	Lateral	Champetier de Ribes's bag	G.	G.	
3	29	Full	Multipara	Marginal	Normal labour	G.	G.	
4	26	Full	Multipara	Marginal	Child lying transversely; internal podalic version	G.	G.	
5	33	34th week	Multipara	Marginal	Membranes ruptured; tight binder	G.	G.	
6	37	Full	Multipara	Lateral	Champetier de Ribes's bag; R.O.P. manual rotation forceps	G.	G.	
7	38	27th week	Multipara	Lateral	Champetier de Ribes's bag; internal version	D.	S.	Mother developed septicaemia; *B. coli* and a diplococcus grown from the uterus. Criminal abortion had been procured in this patient before her admission.
8	41	Full	Multipara	Marginal	A case of twins, the placenta of the second child being praevia; rupture of second sac. Inj. ergot hyp., mxj; liq. strych. hyd. miij, hypodermically	G.	G. S.	

done. The abnormal and complicated cases are used for more advanced instruction, directed not so much to the individual clerk as to the whole class. Not the least advantage to the student in the ward-teaching is the opportunity it affords of learning the management of the lying-in mother and her baby. The many little matters of much importance in family practice which were unavailable for instruction purposes are now brought to his notice, though it is not always easy to make him pay proper regard to them, probably because his perspective is based too much on examination requirements. Indeed, looking back on nearly two years' experience of ward teaching of obstetrics, we can only wonder that so important a part of the family practitioner's work was left so long to be picked up haphazard in the outdoor maternity. The advantage of the old system in personal responsibility is still retained, but it is based on a very different foundation of knowledge and experience, and the student now depends on his extern work rather to learn how to adapt his methods to the far from favourable conditions he finds in the patient's own home—to learn, indeed, how to do without the many things he found to his hand in the hospital—than in acquiring clinical experience. The chances are that the 20 or 30 cases he sees outside are mostly straightforward. To the student, to the extern patient, and ultimately to the whole community, no reform in medical education has been of greater importance than this preliminary hospital instruction in midwifery.

Contracted Pelvis.

Case.	Age.	Maturity.	Parity.	Pelvic Measurements.				Treatment.	Result.		Weight of Child.	Length of Child.
				Intersp.	Inter-crist.	Ext. Conj.	Diag. Conj.		Mother.	Child.	lb. oz.	
1. E. W.	30	38th week	Mult.	9¾	10¼	—	4¼	Induction with toy bag and Champetier de Ribes's bag	G.	G.	6 14	20 in.
2. E. A.	35	38th week	Mult.	9	11	—	—	Induction with toy bag and Champetier de Ribes's bag	G.	G.	6 14	20 in.
3. C. W.	32	Full	Mult.	9½	10½	—	3½	Caesarean section	G.	G.	6 5	21¼ in.
4. A. I.	32	Full	Mult.	—	—	—	4½	High forceps; advised to come up for induction at 37th week, but did not come till in labour	G.	S.	8 0	—
5. M. H.	24	Full	Prim.	9½	10	7½	4¼	Old case of tuberculous hip induction with toy bag and Champetier de Ribes's bag; high forceps	G.	S.	—	—
6. H. H.	23	38th week	Mult.	9¼	10½	—	Not felt	Induction with bougies; normal labour	G.	G.	7 6	18½ in.
7. M. B.	25	36th week	Mult.	8½	9¾	—	4¼	Induction with Champetier de Ribes's bag; normal labour	G.	G.	6 2	18 in.
8. E. G.	23	Full	Prim.	9¼	10¼	—	3¼	Caesarean section	G.	G.	5 13	18¾ in.
9. S. G.	27	Full	Prim.	10½	11¼	6¾	4; true conj. 3¼	Kyphotic pelvis; Caesarean section	G.	G.	5 2	18½ in.
10. K. W.	23	Full	Prim.	10	10½	7¼	4; true conj. 3½	High forceps	G.	G.	8 1	20 in.

Report for Year 1911.

In order to illustrate the opportunities for clinical experience afforded by a ward of this size we give an abstract of the work done during 1911.

383 patients were admitted, and of these 364 were delivered, 19 being discharged undelivered, either because they were not in labour or because they were taken in for a complication of pregnancy and did not require induction of labour. 139 were primiparae and 244 were multiparae. There were 286 cases of uncomplicated labour, of which 2 were face and 8 were breech and the rest vertex presentations. There were 5 normal cases of twin birth.

372 children were born during the year, of which 354 were mature; of these, 27 were stillborn and 4 died; 18 were premature; 3 of these were stillborn and 6 died. Of the abnormal cases there were: Eclampsia 7, placenta praevia 8, contracted pelvis 10 (for particulars of which see tables). Albuminuria 3; in 2 cases labour was induced and in the other came on naturally; all were discharged well. Pernicious vomiting 4; none severe, and all recovered without disturbance of the pregnancy; 1 had gastric lavage and 1 had saline per rectum. Accidental haemorrhage 5, none severe; in only 1 was there any interference—namely, dilatation by Champetier de Ribes's bag. *Post-partum* haemorrhage 6, treated by hot intrauterine douches and ergot or pituitary extract hypodermically.

Obstructed labour 32:

(*a*) Delayed second stage, 21 cases; forceps delivery.

(*b*) Obstructed breech, 5 cases; 3 extended legs; 1 hydrocephalus and 1 large head.

(*c*) Locked twins; 1 case.

(*d*) Transverse lie, 4 cases—one in a case of twins; internal podalic version in all.

(*e*) Impacted shoulders, 1 case; cleidotomy having failed, one arm was amputated and delivery effected.

Various complications, 14 cases:

(*a*) Cardiac and pulmonary disease, 7 cases. In one, a serious case of mitral stenosis, Caesarean section under spinal anaesthesia was performed; and although the patient improved for four days, a fatal attack of cardiac failure occurred on the fifth day (reported in the *Journal of Obstetrics and Gynaecology of the British Empire*, August, 1911, p. 60).

(*b*) Various, including tuberculous cystitis (fatal) and acute rheumatism.

Maternal morbidity—that is, any case which shows a temperature of over 100° F.:

Septicaemia, 2.	Emotional, 6.
Sapraemia, 19.	Urinary, 3.
Gastro-intestinal, 19.	Pulmonary, 3.
Mammary, 22.	Various, 8.
Reactionary, 22.	

There were 7 maternal deaths during the year. Of these, 3 were in cases of eclampsia (see table); 1 in a case of placenta praevia from septicaemia (see table); 1 in a case of tuberculous cystitis and pyelitis; 1 in a case of mitral stenosis, already referred to; 1 in a case of acute pneumonia. Labour was induced, but the patient died shortly afterwards.

THE SIGNIFICANCE OF ALBUMINURIA IN PREGNANCY.*

By EMILY H. SIEDEBERG, M.B., B.Ch., B.Sc.,

PHYSICIAN TO ST. HELEN'S MATERNITY HOSPITAL, DUNEDIN, NEW ZEALAND.

After reading the paper by Dr. Davies-Colley, published in the British Medical Journal of June 17th, 1911, on the association of toxaemia of pregnancy with haemorrhage, I thought that he and other readers of the Journal might be interested in the following statistics of a somewhat similar nature which I have collected from the records of the above hospital for five years. Unlike Dr. Davies-Colley, I find a marked increase in the cases of *post-partum* haemorrhage, not necessarily in eclampsia, but in cases of albuminuria.

When I was making up my first annual report on St. Helen's Hospital in 1906, my attention was directed to the fact that a large proportion of the various abnormalities and complications met with occurred in women who also showed albumen in the urine—for example, haemorrhages, adherent placenta, placenta praevia, and stillbirths, and in publishing the report in the *New Zealand Medical Journal* (October, 1906) I commented on this fact. Since then I have given particular attention to the subject, and now that I have statistics of five years I thought it might be of interest to bring before you the facts which I have collected.

The one possible danger which the obstetrician associates with albuminuria is eclampsia. Well, out of 289 cases of albuminuria which have passed through St. Helen's Hospital, we have had only 5 cases of eclampsia, and yet in many the albuminuria was accompanied by severe toxic symptoms and marked oedema.

Eclampsia is, therefore, not a frequent accompaniment of albuminuria, although I am inclined to attribute our escape from it in many cases to the prophylactic treatment extended to them beforehand. As soon as the patient comes to the hospital to book, which may be in the early months, or not till the seventh or eighth month, a specimen of urine is examined, and if it contains albumen, or if she suffers from toxic symptoms, she is given directions with regard to her diet and the care of the bowels and skin. She is told to report herself from time to time at the hospital, the urine being examined on each occasion, and toxic symptoms inquired for. If these supervene to any extent, she is admitted for perhaps a week's treatment, during which improvement usually occurs. I have mentioned eclampsia merely to show that it is not one of the frequent accompaniments of albuminuria.

I have purposely refrained from calling these albumen cases nephritis. Many of them were so, the kidneys being organically diseased, but in many the albumen was transient, passing away during the puerperium. We examine the urine in all the albumen cases on the day the patient leaves the hospital. We can thus note which are the transient cases, and in which cases the albumen is still present.

The proportion of pregnancies in which albumen is present is a very large one. Out of 1,127 cases which have been under our care, indoor and outdoor, there were 289 albumens—that is, 25.6 per cent.

I have worked out a comparison between the normal cases (that is, no albumen) and the albumen cases on the following points, and I find all the complications more numerous in the albumen cases:

1. History of previous labours.
2. Placenta praevia or low implantation.
3. *Ante-partum* haemorrhage.
4. *Post-partum* haemorrhage.
5. Mental symptoms.
6. Phlegmasia alba dolens.
7. Adherent membranes or placenta.
8. Morbidity.
9. Premature births.
10. Stillbirths and deaths of infants.
11. Inability to nurse, complete or partial.

History of Previous Labours.

I may say that I cannot guarantee perfect accuracy in numbers with regard to these previous histories, as some nurses, in writing up the charts, would get a much more accurate history of previous labours than others who were less thorough in questioning the patients.

Miscarriages.

	Normal (838).		Albumen (289).	
	No.	Per Cent.	No.	Per Cent.
1 Miscarriage	57	6.7	37	12.1
2 Miscarriages	12	1.4	13	4.8
3 ,, ...	3	0.35	3	1.04
4 ,, ...	1	0.12	1	0.34
5 ,, ...	0	0	4	1.36
6 ,, ...	1	0.12	1	0.34

Stillbirths.

In one of the albumen cases the whole five pregnancies resulted in premature stillbirths, and in one there were six miscarriages, one stillbirth at full term, and two which died in a few hours, representing a family of nine children lost.

	Normal.		Albumen.	
	No.	Per Cent.	No.	Per Cent.
Stillbirths	3	0.35	14	4.9
Died within a month ...	3	0.35	7	2.45
Phlegmasia	2	0.24	4	1.36
Eclampsia	0	0	11	3.8

It will thus be seen that, so far as previous histories go, the number of miscarriages in albumen cases is greatly in advance of those in normal cases, being nearly double for those with one miscarriage, treble for two, three, and four miscarriages, also increased for five and six miscarriages. In one of the normal cases there were six previous miscarriages and one stillbirth out of nine, but this case was distinctly syphilitic. There is a marked difference in the stillbirths at full time; the percentage was 0.35 for normal and 4.8 for albumen cases. Similarly, in those which died within a month there is a preponderance among the albumen cases.

Complications.

Among the complications of previous labours not many were inquired for, but phlegmasia was noted in two of the normal and four of the albumen cases; eclampsia in none of the normal and in eleven of the albumen cases.

Histories of Present Labours.

Coming now to present labours—in these the histories are quite accurate.

"Adherent Placenta or Membranes" including Total or Partial Adhesion of Placenta or Membranes.

	Normal (838).		Albumen (289).	
	No.	Per Cent.	No.	Per Cent.
Adherent placenta ...	28	3.3	44	15.2
"Placenta praevia or low implantation"	11	1.3	23	8

In many of the albumen cases the placenta was degenerate in parts

Some of these cases had free *ante-partum* haemorrhage, some no haemorrhage, the condition being only diagnosed after the birth of the placenta, when the latter was found

*Read at a meeting of the Otago Branch of the British Medical Association.

attached to the margin of the opening in the membranes through which the child had passed, the membranes being complete.

Ante-partum Haemorrhage—either accidental or unavoidable:

	No.	Per Cent.
Normal	11 ...	... 1.3
Albumen	20 ...	... 6.9

Many of these were only slight, but the preponderance in the albumen cases is marked.

Threatened Post-partum Haemorrhage.—Threatening *post-partum* haemorrhage—that is, cases in which the discharge was so profuse that special measures were required to overcome it and a nurse told off to watch for some hours for a possible return of it; in these I have not included cases due to adherent placenta:

	No.	Per Cent.
Normal	25 ...	... 2.9
Albumen	26 ...	... 9

Mental Symptoms, including Violent Hysteria, Melancholia, and Mania:

	No.	Per Cent.
Normal	1 ...	... 0.12
Albumen	9 ...	... 3.1

Morbidity (taking a temperature of 100° and over lasting for at least two consecutive days):

	No.	Per Cent.
Normal	53 ...	... 6.2
Albumen	55 ...	... 19

The total number of cases in which there was inability to nurse was 225. Of these, 83, or 36.8 per cent., had albumen. Of the rare complications, such as phlegmasia, anencephalus, and vesicular mole, we had one of each, and in each case there was albuminuria. Of the complications which are usually associated with albumen—namely, toxaemia, oedema, and eclampsia—we had 29 with toxaemia, 56 oedema, and 5 eclampsia; all had albumen.

	Normal.		Albumen.	
	No.	Per Cent.	No.	Per Cent.
Premature births ...	4	0.47	30	10.3
Stillbirths	15	1.79	21	7.2
Died before leaving hospital	5	0.39	9	3.1

The history of the stillbirths, and the deaths shortly after birth, are particularly instructive. I found that in the normal cases there was a much larger proportion of what one might call unavoidable deaths—for example, due to impacted breech presentations in primiparae, a large child in a small pelvis, accidents to the mother shortly beforehand, and cases of prolapsed cord; whereas in the albumen cases these causes were less numerous, and the purely toxic causes more numerous.

Normal Cases (that is, those with no albumen).

1. Thirteenth pregnancy; previous 12 normal. Had worked sewing machine up to the last, and after one particularly heavy day she felt no more movements. The child was born dead, skin peeling.
2. Fifth pregnancy. Had a fright and heavy fall a week previously, after which no more movements were felt; child macerated.
3. Ninth pregnancy; induction at eighth month for contracted pelvis; had had eight previous craniotomies. This time the cord was prolapsed and the child was stillborn.
4. Induction at eighth month for contracted pelvis; breech presentation; difficulty with birth of head; child stillborn.
5. Primipara; contracted pelvis, head would not engage, high forceps required; child stillborn.
6, 7. Presentation of cord.
8. Second pregnancy; premature at six and a half months, the first pregnancy ending at five months; syphilis.
9, 10. Incomplete closure of foramen ovale; died on the third and sixteenth days respectively.
11. Her sixth pregnancy; premature at seventh month, no definite cause; mother healthy.
12. A very large child, born asphyxiated; required long artificial respiration, but died in convulsions in twenty-eight hours.
13. Sixth pregnancy; had severe *ante-partum* accidental haemorrhage; child was weakly, and died on the second day.
14, 15, 16. These were admitted with haemorrhage from placenta praevia, one at sixth month; the other two became collapsed; internal version was rapidly performed, but the child was dead in each case.

In the remaining four the mothers were weakly and anaemic, evidently preventing full nourishment of the child; in two they were macerated, in one the placenta was degenerate; and in the fourth it was her fifteenth pregnancy; the baby was pinched and ill-developed, and died in two days with haemorrhage from mouth and rectum.

The last four, therefore, are the only ones in which the death of the child could be attributed to the poor health of the mother, unless we include the three cases of placenta praevia, which may indirectly have been due to the mother's health.

Albumen Cases.

A total of 30 cases of stillbirths or early death, 24 of these being due to ill health in the mother, and only 6 due to such causes as placenta praevia, prolapsed cord, or difficult birth (in a small pelvis):

1 and 2. Prolapsed cord.
3. Primipara, breech presentation, with impacted head and arms.
4. Large child in small pelvis.
5. Large child; required two and a quarter hours artificial respiration, but died in fourteen hours.
6. Central placenta praevia, severe haemorrhage; internal version performed, but the child died.

The remaining twenty-four had bad histories from a health point of view; many showed symptoms of a severe toxaemia; several were cases of twins born prematurely, and one of them dead, sometimes macerated.

I may here say that in the healthy mothers, where twins were born, they both lived and were healthy, usually going to full term.

It is interesting to observe the different ways in which the toxaemia showed itself in the symptoms both of the mother and child.

Symptoms of Toxaemia.

1. Thirteenth pregnancy; heavy albumen and oedema; premature at eighth month. Her eleventh had died soon after birth, and her twelfth was stillborn at the seventh month; the previous ones healthy.
2. First pregnancy; heavy albumen. Sent in as urgent case from Middlemarch for excessive vomiting and jaundice; premature at eighth month; macerated.
3. First pregnancy, premature, eight and a half months, macerated; slight eclampsia on the following day with twitchings of face muscles, severe headaches, and swelling, with purple discoloration of face.
4. Tenth pregnancy; heavy albumen and oedema, stillborn; the second pregnancy was the only child living; there had been four premature births—two stillbirths at full term, one died after three hours and one after twelve hours.
5, 6. First pregnancies; heavy albumen, severe toxic symptoms, one full term, one premature.
7. Third pregnancy; premature; baby collapsed and died in two days from haemorrhage from the stomach.
8. Second pregnancy; severe vomiting and headaches; history of convulsive movements felt two days previously, then cessation; the first child had died, aged 7 months.
9. Fifth pregnancy; first and fourth stillborn; severe *ante-partum* accidental haemorrhage with collapse and inertia; child delivered rapidly by forceps, but dead.
10. Fifth pregnancy; under treatment in hospital for three weeks previously for toxaemia; child had spasmodic breathing from birth and poor circulation, frequently going blue and cold; died third day.
11. First pregnancy; baby had asphyxia at birth, heavy rapid breathing, spasms of larynx, and inability to swallow; died fifth day.
12. First pregnancy; heavy albumen; a twin premature at seven months; lived thirty-six hours.
13. First pregnancy; premature at seven months; born asphyxiated; died in a month.
14. Fifth pregnancy; brought to the hospital in a state of collapse, weak and cold from haemorrhage; child prematurely born rigid and dead. In her first pregnancy there had been haemorrhages, and the fetus died at the seventh month; her third and fourth were abortions.
15. Seventh pregnancy; vesicular mole.
16. First pregnancy; anencephalic fetus.

The remaining eight had the usual toxic symptoms; some of the children were premature, some macerated, some died in two or three days from convulsions or general weakness. Several of the mothers had a history of previous stillbirths or early deaths in the children.

Many of the mothers with heavy albumen collapsed to an alarming extent after labour, causing grave anxiety. The only death was one in which *post-mortem* examination revealed extensive changes in the kidneys.

In a few cases the baby had oedema; in some there was collapse of the child, requiring stimulants, and sometimes a saline per rectum, but afterwards recovering. Many of those who lived were below the average weight. In one case there were deformed feet. Two cases occurred of the child dying from haemorrhage of the stomach or bowels; one child had subsequent haemorrhage of the umbilicus, where the mother had heart disease, and was collapsed for some time after labour.

Return Cases.

The return cases to the hospital are also particularly instructive and interesting. I have details of fourteen return cases in which there was albuminuria for at least one of them. They distinctly show that in the pregnancy in which albuminuria was present, other complications were present; when the same woman had no albumen the labour was normal:

1. She first came to St. Helen's for her third pregnancy, which was normal in every way. Fourth pregnancy also normal. In both cases she nursed the baby entirely. Fifth pregnancy, albuminuria, complicated with uterine inertia, adherent marginal placenta, *post-partum* haemorrhage; milk had to be supplemented with artificial food.
2. Primipara; albuminuria; child born prematurely at eighth month. Second pregnancy, no albumen, and normal in other ways.
3. Her third pregnancy, heavy albumen, fetus macerated, premature at eighth month, excessive vomiting, and low condition of health. Fourth pregnancy, had treatment throughout whole period; the baby throve, no complications, except a poor milk supply and a tendency to run a temperature.
4. First pregnancy, trace of albumen, subinvolution with retention of lochia; ran a temperature. Second pregnancy, no albumen, normal in every way.
5. First pregnancy, albuminuria, twins, one dead, marginal placenta, *ante-partum* haemorrhage, oedema and toxic symptoms requiring treatment in hospital beforehand. Second pregnancy, no albumen, normal in every way.
6. Had one before she came to St. Helen's with albuminuria and eclampsia. The first at St. Helen's, albuminuria, toxic symptoms treated in the hospital beforehand; had *post-partum* haemorrhage and collapse. Second, in hospital, albumen only slight, no complications, except very free discharge. Third, trace of albumen with slight oedema, no complications, no haemorrhage. Fourth, trace of albumen with oedema, faintness beforehand, but no complications. This one continued to improve in each successive pregnancy, as she understood better how to manage her health.
7. First pregnancy, no albumen, normal. Second pregnancy, very slight albumen, no complications. Third pregnancy, heavier albumen; had *post-partum* haemorrhage.
8. Fourth pregnancy, trace of albumen, milk scanty; baby lost weight. Fifth pregnancy, normal, no albumen; baby throve. Sixth pregnancy, slight albumen; had frequent headaches and epistaxis; baby not very healthy, and losing weight.
9. First pregnancy, no albumen; normal in every way. Second pregnancy, trace of albumen, headaches; baby premature at eight and a quarter months.
10. First pregnancy, distinct albumen, threatening *post-partum* haemorrhage. Second pregnancy, no albumen; normal.
11. This one is particularly interesting. She came to book in the early months for her seventh pregnancy, and gave the history that at her second pregnancy she had had eclampsia, and in all since she had had oedema, headaches, and giddiness. She was given advice and treatment; no albumen appeared; baby 9¼ lb., and throve well; no complications. Eighth pregnancy; possibly she thought she was all right now, and took no precautions; there was albumen, oedema, and toxic symptoms; the babies, twins, were born prematurely at seven and a half months, both very weakly, requiring stimuants; fingers of both children pustular.
12. First pregnancy, slight albumen; child premature at seven months; born asphyxiated and weakly; milk scanty; child died in one month. Second pregnancy, trace of albumen, which di appeared in a few days; milk good; normal confinement. Third pregnancy, no albumen; normal. Fourth pregnancy, slight albumen; threatened miscarriage at sixth month, with haemorrhage; milk poor.
13. First pregnancy, albumen, symptoms of eclampsia, during first day *post partum;* face swollen and purple, could not see; pulse rapid, twitching of face muscles; child macerated; placenta degenerate. Second pregnancy, distinct albumen; patient under treatment for last two months for toxic symptoms; had *post-partum* haemorrhage and adherent placenta; baby throve.
14. First pregnancy, heavy albumen and oedema; under treatment for last month; baby two weeks premature; membranes ragged and part retained. Second pregnancy, had advice and treatment throughout; very slight albumen, no oedema; placenta and membranes intact; went to full term; baby throve.

When we come, then, to examine these cases carefully, we see a remarkable preponderance of complications in those showing albuminuria. It is evident that the albumen is only the visible sign of profound metabolic changes which are taking place in the body, and if the excretory organs fail to respond to the extra demand made upon them, the waste products of cell metabolism, probably from the disintegration of protein, circulate in the blood, act as an irritant, and lead to the development of inflammatory changes in the renal tissue, causing degenerative disease, and resulting in that type of nephritis of a transient nature which we usually separate from true inflammatory nephritis. If the condition is not recognized early, the waste products accumulate, and will lead to more serious disease, ultimately resulting in the death of the mother from eclampsia. It is fortunate that we have this one sign—the presence of albumen—as an indication of the slow toxaemia which is going on, as in many cases there is absolutely no other symptom of the mischief which is brewing. Indeed, I remember one case in my private practice where the woman was in excellent health—always had been—but as I made a rule of examining a specimen of urine at the seventh month I examined hers, and was surprised to find it heavy with albumen. I immediately explained her condition to her, and put her on treatment. She got safely through the confinement in a normal way, but I had just returned home again at three in the morning when a message came from the nurse to say that she had eclampsia. Fortunately it was mild; she had only three fits, and made a good recovery; but until that first fit appeared, although I had been on the look-out for symptoms, there was no indication of anything being wrong.

The fact that haemorrhages are more frequent in cases of albuminuria is only what we would expect, as we know that renal inefficiency is associated with serious disturbances of the vascular system, manifested by an increase in the general blood pressure, by cerebral and retinal haemorrhages and epistaxis, and finally leading to changes in every organ of the body, the uterus included. If the condition recurs through two or three pregnancies, no doubt actual arterio-sclerosis would arise, and from the histories of previous pregnancies which I have collected, it is evident that the same cause has been acting in several, producing permanent changes. This would account for such complications as placenta praevia, haemorrhages, and adherent placenta or membranes, possibly also for phlegmasia alba dolens. The increase of cases showing mental symptoms is quite easily accounted for, as a toxaemia from any cause will affect the brain and nervous system. The increased morbidity is, I think, due not so much to the direct effect of the poison in the body, as there is usually no temperature before labour, but rather to a want of resisting power in the body generally, to the attack of those organisms which would be present in the vagina, and which would quickly get the upper hand.

The stillbirths and early deaths which so markedly preponderate in the albumen cases would be accounted for: (1) By the direct effect of the toxaemic blood circulating through the placenta, degeneration of which frequently occurs, and thereby gaining access to the child; for there can be no doubt that this poison does find its way to the child, as is shown directly by the occasional occurrence of oedema in the children. Might not the various haemorrhages in the newborn—for example, in the skin, from the mouth, the navel, the nose, and the gastro-intestinal tract—be also produced by the circulation of this toxin in the fetal blood? (2) Once degeneration of the placenta sets in, a certain amount of nourishment to the child is cut off and the child dies.

Exactly what causes premature birth it would be difficult to say, but possibly the toxins circulating in the blood act as an oxytoxic, setting up uterine contractions. Every patient is not similarly affected, as many show a slight albuminuria with no other complications than that of anaemia, whilst a few, but a very few, have heavy albumen and no complications other than anaemia, bad varicose veins, poor milk supply, and occasionally degenerate placenta.

There is no doubt, however, that the presence of albumen during pregnancy is a serious indication, and is likely to be the forerunner of some complication in labour. It is a strong plea for the more frequent examination of the urine during pregnancy and the more careful supervision of the general health, in the latter months, by the obstetrician engaged to attend the woman.

In the subsequent discussion on the paper one of the chief points raised by several members was the difficulty of understanding why placenta praevia should occur more frequently in cases of albuminuria. The reply to this was that these were probably not cases of transient albuminuria produced by a toxin, but cases of true nephritis in which endometritis had been set up, thus allowing the ovum to fall lower in the uterine cavity before it found a resting place.

As a cause of the oedema, albuminuria, and haemor-

rhages, Professor Malcolm suggested that the circulation of the toxin in the blood damaged the endothelium of the vessels, thus producing greater permeability in the walls of the vessels, and a greater liability of the capillaries to rupture.

It is also possible that the contractile power of the elastic and muscular walls is diminished; this would account for the *post-partum* haemorrhages.

A PERSISTENT OCCIPITO-TRANSVERSE PRESENTATION: LABOUR OBSTRUCTED AT THE PELVIC OUTLET.

BY

HAROLD CHAPPLE, M.C.Cantab., F.R.C.S.Eng.,

OBSTETRIC ASSISTANT TO GUY'S HOSPITAL.

In the conduct of a case of difficult labour it is generally the practice to attach so much importance to the determination of the lengths of the diameters of the pelvic brim that the consideration extended to the pelvic outlet is apt to be rather meagre.

A moment's reflection on the normal mechanism of labour will show this to be irrational, as it is clear that any marked diminution in the size of the pelvic outlet will provide a most definite barrier to the passage of the child. For scientific delivery as accurate a knowledge of the pelvic brim as it is possible to obtain is, of course, essential. But our estimate of the size and shape of the pelvic outlet is of equal importance.

As a result of a number of observations that I have made on patients who had previously suffered from somewhat extensive perineal lacerations, I am convinced that a diminished pelvic outlet is a much commoner condition than is apparently generally supposed, and that the omission to recognize its presence has been responsible for a very large proportion of the difficulties experienced in delivery when once the fetal head has passed the pelvic brim.

In the estimation of the size of the pelvic outlet it is necessary to measure the distance between the ischial tuberosities, this being its narrowest diameter. This is of great value as far as it goes, but if we consider the process of extension by which the head is delivered it is obvious that it is not enough. The distance between the tuberosities is dependent on two factors—namely, the length of the pubic rami and the angle included by them—the subpubic angle. The ease with which the fetal head will escape from the vaginal outlet will depend very largely on that angle. Of two pelves with an equal distance between the tuberosities, the one with the wider subpubic angle and shorter pubic rami will clearly offer the less obstruction to the passage of the head during its delivery by extension. To work at the best advantage the suboccipital region of the fetal head should lie in contact with the under border of the symphysis pubis during this process and form, as it were, the fixed point of a lever, the length of which is determined at any instant by the particular diameter of the fetal head escaping at the moment, and which consequently varies continually during the extension. If the subpubic angle be so small that contact between these parts is rendered impossible, it follows that the length of the lever must be increased by the distance between the suboccipital region and the under border of the symphysis. This increase must of necessity put an additional strain on the perineal tissues, and so increase the difficulty of delivery and render a laceration more likely. This condition consequently calls for additional care in extending the head over the perineum.

As the shoulders escape the same thing is true. Their escape is a much more fruitful source of perineal laceration than one is often led to believe, and, in my opinion, they are in the majority of cases the determining factor. The process of their delivery is frequently apt to be more hurried than scientific.

The case on which this note is based forms an excellent instance of a presentation at the pelvic outlet, which I have here described as an occipito-transverse. By this I mean that in these cases the sagittal suture lies deep on the pelvic floor and in the transverse diameter of the pelvis, the posterior fontanelle being in the right and the anterior fontanelle in the left lateral aspect of the pelvis, or vice versa.

I am unable to find any description of this condition in the standard English textbooks, though it is dealt with by the German authorities, the condition being known as a *Tiefer Querstand*. It is not very rare, and the case under consideration is one in point. It is not necessarily dependent on obstruction of any kind, but is probably a variation of the mechanism of an occipito-posterior presentation. Its recognition is very important from a point of view of treatment, as delivery is greatly facilitated by the knowledge of a suitable method of applying forceps should the occiput not rotate forward under the symphysis. The general rule that their application should be made in the transverse diameter of the pelvis obviously does not hold good in these cases, as the result would be to apply them with one blade over the face and the other over the occiput of the child, and an attempt at delivery would end in disaster. Under these circumstances the forceps therefore should be applied in one or other oblique diameter of the pelvic outlet with their pelvic curve towards the occiput of the child. Then during traction the forceps are rotated gradually into the opposite oblique, with the result that the occiput is swung round under the symphysis, and delivery is then effected in the usual way. To any one with a knowledge of the application of forceps this method of delivery is quite simple, and in the case under consideration was attended with an excellent result.

M. B., a primipara, aged 20, came into labour on August 14th; she had had slight pains throughout the day. The membranes were said to have ruptured earlier in the day, but strong labour pains did not commence until 6 p.m. She was examined at 7 p.m., and the os was stated to admit three fingers. It was fully dilated by 10 p.m., and before 11 p.m. the head was well down on the pelvic floor, and could be seen just inside the vulva. The pains now became more frequent, and although they were occurring every four minutes and were very strong, the head did not advance. At 12 midnight meconium began to issue from the vagina and the pains became still more severe, and the pulse-rate rose steadily. She was admitted into Guy's at 2.30 a.m., and when I saw her she was beginning to become very distressed, the pains were frequent and severe. The pulse-rate was now 110, and the interval between the pains was short. The back of the child was made out to be to the right. Meconium was issuing from the vagina, and the fetal head was visible on separating the labia. The fetal heart was counted at 152.

The patient was anaesthetized, and on examination there was a large caput extending over both parietal bones, and the sagittal suture was found to be lying in the transverse diameter, with the posterior fontanelle to the right and the anterior fontanelle to the left. The distance between the ischial tuberosities was 2¼ in., and the subpubic angle was noticed to be small. Obviously the further progress of the head was completely obstructed by the narrowness of the outlet. By applying forceps in the left oblique diameter, and by rotating them into the right oblique during traction, I was able to swing the occiput under the symphysis. Realizing the smallness of the subpubic angle, great care was used in extending the head and the living child delivered with a small amount of laceration. This was immediately closed with sutures, and primary union has taken place.

The child was not large, and weighed 6 lb. 12 oz. Its head was 14 in. in circumference, its biparietal diameter was 3¾ in., bitemporal 3¼ in., mento-vertical 5½ in., occipito-frontal 4¾ in., and suboccipito-bregmatic 3¾ in. The obstruction was, therefore, not due to any fetal abnormality. Under the anaesthetic the diagonal conjugate was measured and found to be 5 in., and an estimate of the pelvic brim showed that no source of obstruction was present. This agreed with the clinical history of the labour.

This case, then, serves to illustrate the following points:

1. The necessity of always determining in a case of labour the size and shape of the pelvic outlet.

2. In forming an estimate of the amount of obstruction likely to occur at the pelvic outlet we should be guided both by the distance between the ischial tuberosities and by the subpubic angle.

3. The existence at the pelvic outlet of a presentation, here described as an occipito-transverse.

4. The rational treatment of such a presentation, should it persist, consists in an application of forceps in an oblique diameter of the outlet, and while traction is being made they should be rotated into the opposite oblique, with the result that the occiput is swung under the symphysis and delivery effected in the usual way.

A PLEA FOR A UNIVERSAL STANDARD IN THE OBSERVATION OF THE MORBIDITY OF CHILDBED.*

By A. W. RUSSELL, M.A., M.B.,
OBSTETRIC PHYSICIAN, GLASGOW MATERNITY HOSPITAL.

It is one of the notable signs of a real advance in obstetrics that nowadays, for purposes of statistics, and consequently for the improvement of treatment, attention is given, not merely to the rate of mortality incident upon childbirth—always a criterion of some value—but also, and more particularly, to those earlier and often slighter changes, indicated by a rising temperature and a quickening pulse, which have been grouped under the heading of morbidity. It must be admitted by all that it is the closer and more general attention to this morbidity of the childbed that has led to an earlier recognition and a more efficient treatment of those septic puerperal complications which so frequently cripple, and at times kill, the unfortunate patient. The question has therefore an important educational value.

No one who has studied the periodical reports of "maternity" hospitals in any country can rest satisfied with the present methods of observing and recording the morbidity of childbed, or with the varying standards created by individual observers, which greatly reduce the value of otherwise careful and reliable records.

For comparison of statistics, either of individuals or of hospitals, the present state of matters cannot be said to be satisfactory. One observer takes the temperature of his patients in the mouth, another in the axilla, a third in the rectum; one hospital records its temperatures at different hours or intervals of the day from another; one authority disregards the temperature of the first twenty-four hours, another includes it. The correctness of the thermometer also varies, and there is need for strict regulations as to all the precautions to be observed both by doctors and by nurses in the actual method of taking the temperature. The question of the pulse is disregarded by some and is considered very important by others, and by the latter the pulse-rate is always taken into account in estimating their morbidity. Again, abortions are included by some, excluded by others; while some hold that all deaths should be included, others that only deaths accompanied by some degree of fever should count.

All these varying conditions and methods lead us to the most difficult question of all—the unfortunate variation of the standards that have been adopted by different individuals, hospitals, or associations. To illustrate this important point I shall take four familiar standards of morbidity—the so-called Continental standard of 38° C. or 100.4° F., and the standards of the British Medical Association, the Rotunda Hospital, Dublin, and Queen Charlotte's Hospital, London.

Table of Cases taken by one Observer and Tested by these Standards.

	Primi-para.	Multi-para.	Total.
1. Queen Charlotte's Hospital*	37	7	44
2. Continental, 100.4° F. (38° C.)	26	6	32
3. Rotunda Hospital, Dublin, 99° F. (37.2° C.)† ...	14	2	16
4. British Medical Association, 100° F. (37.8° C.)‡	11	1	12

* Every temperature above 100° F (37.8° C.) is morbid.
† When temperature after first 24 hours exceeds 99° F. and pulse 90 on three consecutive occasions, the case is morbid. Include abortions, but exclude death without fever.
‡ If the temperature reaches 100° F. on any two occasions between the second and eighth day the case is morbid. Include all deaths, but exclude abortions.

Conclusions.

Surely the foregoing considerations and these figures that so markedly demonstrate the disparity of the four standards warrant the following conclusions:

1. It is desirable to have a uniform standard for the scientific records of morbidity in the puerperium.
2. For this only thermometers of ascertained correctness should be used.
3. The observation should always be made in one place, preferably the mouth, and extend over a fixed time.
4. The temperature should be taken at stated intervals and at the same time of the day, and the first day should be included.
5. The record should include all abortions and also all deaths with a previous morbidity.
6. Both temperature and pulse should be taken, and the lower limit in each should be fixed by resolution of the International Congress for Obstetrics and Gynaecology, and thus become a recognized, universal, uniform standard of morbidity for use in all scientific communications.

* Extract from a paper read at the International Obstetrical and Gynaecological Congress, Berlin, September, 1912.

SOME REMARKS, WITH STATISTICS, ON THE TREATMENT OF 1,305 SCHOOL CHILDREN (LONDON COUNTY COUNCIL)

AT THE ROYAL LONDON OPHTHALMIC HOSPITAL (MOORFIELDS).

By FRANK MOXON, M.B., B.S.Durh.,
CHIEF CLINICAL ASSISTANT.

In presenting this report on 1,305 children who passed through my hands in the special department for the treatment of London County Council school children during the nineteen months from May 27th, 1910, to December 31st, 1911, at the Royal London Ophthalmic Hospital, "Moorfields," I am conscious that the number of cases dealt with is too small to enable one to make any dogmatic assertions, but I am hopeful that, at any rate, the details may be of some interest to those concerned with the welfare of the children. The bringing together of such large numbers of children for treatment gives one most valuable opportunities for studying the wider problems of refractive errors, which errors represent the major portion of the eye defects in children—for example, the factors at work in their causation and development; the effect of environment, nutrition, feeding, study, age, heredity, etc., particularly in regard to myopia, its beginning and progress.

I propose first to deal with a few aspects of medical inspection as they occur to one engaged in treatment. I may remind the reader that, when speaking of inspection, I am only referring to the inspection for defects of vision.

First, in regard to the periods of the child's school life in which inspection takes place, these periods, so far as the London County Council scheme is concerned, are the following:

(*a*) Entrants.
(*b*) Age 8 to 9 group.
(*c*) Leavers, aged 13 to 14.
(*d*) Those cases specially referred by the school teachers.

It is group (*b*) that I am more particularly concerned with, and I feel strongly that instead of inspecting the children of about 8 or 9 years old, it would be of more value if they were re-examined when 6 or 7 years old, or as soon as the child is able to read the alphabet, because, although, no doubt, a few at the time of entrance inspection—namely, at 5 years old—are able to read the test types, yet the larger number cannot, and are therefore classed as "illiterates," and unless they have some obvious defect, they are passed over until the next inspection period, which, as I have said, takes place at 8 or 9 years of age. To digress a little, I might, perhaps, mention that, as a matter of fact, many children who do not know their alphabet or numerals, can be got to read some form of "illiterate" type. Personally, I am in favour of, and use the E type, which consists of a series of the letter E placed in various positions—for example, E 🄴 🄴 🄴, each line or row of letters being made to correspond in size to those of the standard Snellen type. The child is given a metal letter E, painted black and mounted on a handle; after a little explanation and encouragement the child is soon got to place the mounted E, which is held in the hand, in a position corresponding to that of any letter E pointed out by the examiner on the test card. However, there is no denying the fact that this test takes some

time and patience, and would not, therefore, be generally applicable for routine inspection work.

To return to my point on the inspection of group (*b*), I wish to emphasize the fact that if this second inspection were carried out at 6 or 7 years of age we should then be catching squints and myopia nearer the time of their inception, or at any rate at a more favourable time than is the case if we wait until they are 8 or 9 years old, or until a time when they show some such pronounced signs of defect as squinting, or, in the case of the myope, an inability to read the blackboard from the back benches, etc. It would be better still, no doubt — certainly as regards squints—if we could have the children inspected from birth onwards, when we should get all the squints in our net at the very beginning; but I fear this ideal is at present impracticable, and would no doubt call forth much hostile criticism. Nevertheless, can it be denied that if these children were reared from birth under the careful supervision of the school doctor, with the aid of his Health and Care Committees, we should then be able to get at and remove the seeds of future constitutional weaknesses and defects before they had taken root and developed into their many evil forms—bad feeding, stuffy atmospheres, giving rise to poor nutrition and stunted growth, and laying the foundations for the development of our myopes with their weak sclerotics, or our hypermetropes with their arrested eye development?

Another matter in regard to vision inspection is the wide diversity of opinion in regard to what vision should be called "normal" and what "defective." I have found in reading through some twenty or more school medical officers' reports that $\frac{6}{12}$ vision has frequently been adopted as the dividing line, as it were, between the "defective" and the "normal"; that is to say, that all with vision of $\frac{6}{12}$ or less are sent for treatment; those with $\frac{6}{9}$ are not; or, again, if a child can get $\frac{6}{12}$ each eye, and $\frac{6}{9}$ or $\frac{6}{6}$ partly with binocular vision, then it is not sent for treatment; or all with vision of $\frac{6}{12}$ or less, together with such of those with $\frac{6}{9}$ vision as show some obvious sign or symptom of distress, are sent for treatment. Quoting from the 1910 report of the Medical Officer (Education) of the London County Council, it is there stated—page 127—that "bad defects of vision or eye diseases were recorded in 18,923" children; and further on the following comment is made: "It will be seen that these are minimal numbers, and in the case of visual defects a comparatively *low standard* (the italics are my own) is taken; below Standard V, for instance, visual acuity of $\frac{6}{18}$ is taken as the beginning of what is called defect," and $\frac{6}{12}$ is only called defective vision in those children who are in Standard V or VI. I freely admit that a subjective vision test in the case of children is often unsatisfactory, a child one day, for instance, reading $\frac{6}{18}$ and the next $\frac{6}{9}$, which may be due to fear, stupidity, inexperience of the examiner, malingering, or spasm of accommodation; but this cannot be held to be a valid reason for permitting a child who, when in any standard below V, reads $\frac{6}{12}$, to wait until promoted to Standard V before being sent for treatment. To me it seems entirely wrong. No doubt the visual acuity appears in some cases to increase as the child gets older, so that a child who reads $\frac{6}{12}$ when 7 years old might be found to read $\frac{6}{9}$ or $\frac{6}{6}$ when 9 or 10 years old; but I am convinced that more often this so-called improvement in the vision is merely due to greater use and development of the accommodation, enabling the hypermetrope thereby to mask his real defect; whereas in the case of the myope it is due to narrowing of the palpebral fissure and screwing up of the eyes. Then, after all, why should a new standard for normal vision be set up? Our present $\frac{6}{6}$ or standard vision is not too severe or exacting, many children being able to read $\frac{6}{5}$, or even $\frac{6}{4}$. Personally, I feel strongly that if a child cannot read $\frac{6}{6}$ and Jaeger I with each eye, then that child should have a more detailed examination; if there is any doubt about the subjective test, give the child the benefit of the doubt and have it sent to the treatment centre for further examination. It is sometimes stated that a child may read, for instance, $\frac{6}{12}$ each eye, whereas binocularly $\frac{6}{6}$ may be obtained, and this case is frequently classed as $\frac{6}{6}$ vision, and so allowed to pass as normal; but frequently this apparent binocular increase of visual acuity is again simply due to a greater effort of accommodation in the case of the hypermetrope, or in the case of a myope a more ready adaptability in screwing the eyes up when both eyes are being used. Amongst the $\frac{6}{6}$ partly, the $\frac{6}{5}$, and the $\frac{6}{12}$ visions we shall find our early myopes, our hypermetropes and future squints. Must we wait until our myope can only read $\frac{6}{18}$ or our hypermetrope commences to squint, before we treat them? If myopia is going to be treated at all, then the sooner treatment is begun the better; treatment here does not only consist in prescribing appropriate lenses, but, what is of equal importance, also instructions about the prohibition of fine work, reading and writing at short range, etc., so that even if glasses are not at first ordered for the slighter defects, yet we can warn them and keep them under closer observation by re-examining them every six months, or until one is satisfied that no increase in the myopia is likely to take place. Then, again, many of these $\frac{6}{6}$ partly, $\frac{6}{6}$ and $\frac{6}{12}$ have considerable degrees of hypermetropia or hypermetropic astigmatism, who by accommodating are able to mask their defect, at any rate until they become older and use their eyes more for close work.

From the annual report of the London County Council Medical Officer, I find that a separate register is kept at each school, recording those cases which have had treatment, and that the school doctor re-examines these said cases at various periods, to record the result of treatment; this, of course, is a very necessary procedure, but, certainly in regard to those treatment officers who make a practice of having all their cases up again for re-examination, this means in many cases an unnecessary reduplication of work. But here I more particularly wish to refer to a certain number of cases which are re-examined and tested, not by the school doctor but by the teachers, and in some cases are referred again by them to the treatment centres either because, in their opinion, the glasses do not suit or that the child sees no better with the glasses than without them, etc. Obviously this is not a right procedure; it requires a more or less expert knowledge to pass such an opinion, for quite frequently lenses do not give better vision at first, especially if not worn constantly, and for many other reasons, the details of which I cannot enter into here. I have had several cases referred back to the treatment centre for a change of glasses in which it was stated that the teacher had tested the sight; in none of these cases was this necessary, and only had the effect of causing annoyance to the parent, who was put to the trouble and expense of taking a fruitless journey.

Finally, I am of the opinion that it is unfortunate that the card notes which are now made and kept for each child inspected are not sent, or a copy of them sent, with the child when brought up to the treatment centre, so that the treatment doctor may in all cases note for what defect the child is actually sent up. This would do away with many difficulties—for example, a child is sent because it has slight conjunctivitis; on arriving, perhaps several days later, at the treatment centre, this condition has cleared up; or, again, a child may be sent up with perfectly good vision, but it has been noted by the school inspector or teacher that the child frowns, has headache, or occasionally squints, etc.; on arriving at the treatment centre these complaints or signs are not always stated or seen, and if there is little or no refractive error, the vision is good, and the eyes otherwise appear normal, then it is only too often asked by the treatment doctor, "Why has this child been sent up?" or, on the other hand, the school doctor says, "Why is this child sent back without treatment?" If some notice were sent through the secretaries of the Care Committees, stating precisely what defect had been found and what symptoms complained of, a great deal of misunderstanding would be removed.

These will, perhaps, be considered trivial details in connexion with inspection and treatment, but I have thought well to mention them in the hope of reducing the difficulties in the stupendous undertaking of inspection and treatment of school children, and in the endeavour to correlate the work of the school doctor and the treatment doctor.

I will now briefly outline the method I adopt for re-examination of my cases. First, all myopes, in which class I include cases of mixed astigmatism, are given their full correcting lenses after careful retinoscopy, a note made of the exact refraction and the vision with correction under atropine; a note is made of the family

history, nutrition, etc., the presence or absence of any fundal or macular change, the presence or absence, and if present the size of a myopic crescent; if at the time of the first examination the case is obviously one of progressive myopia, or if there is any doubt about its being progressive, then the parent or guardian is asked to bring the child for re-examination in four months' time, also to prohibit the child in the meantime doing any reading, writing, or sewing, and warned that it would be advisable to educate the child with a view to some future occupation which does not necessitate the close application of the eyes. The higher degrees of myopia, and any that are considered to be of a progressive nature, are recommended for the Special Myope School, where a special schedule for their teaching has been drawn up by Mr. Bishop Harman. It seems that there is need for further schools or classes of this nature, as I find that there are cases recommended by me for special treatment that have not yet obtained it. In addition to this, the London County Council official, who is always present at the hospital, interviews the parent, and carefully explains the necessity and advantages of carrying out the treatment ordered, and at the same time repeats the details of treatment; a note is also made of all those cases instructed to return, and the time to return for re-examination. A notice is then sent to the secretary of the Care Committee for the district from which the child comes, repeating the above instructions, and finally a note is made in a register kept at each school by the teachers. This latter procedure to ensure the correct carrying out of treatment is, of course, adopted for all cases, whether myopes or not, if instructed to return for re-examination. All those myopes who are not considered to be of a progressive type are told to return for re-examination in six months. The parents are also warned to discourage excessive use of the eyes in close work, such as sewing or reading bad print in a poor light, and to prevent the child bending over its work with rounded shoulders, cramped chest, constricted neck, and eyes glued to the book, etc.

After the first re-examination I have all progressive myopes up again for re-examination every four or six months, and other myopes, with some exceptions, every nine or twelve months, during school life.

Hypermetropes I divide into two classes (in regard to re-examination)—namely, those of low or moderate degree with good vision, and those of the higher degrees with poor vision; the former I re-examine in one year, the latter in six or nine months.

My reasons for re-examining these hypermetropic cases in what to some may seem an unnecessarily short time are—not forgetting that we are dealing with children—because there are but few who do not very soon require the spectacle frames repaired, broken lenses replaced, or a general straightening up of the frames, together with re-centring of the lenses; this latter a most important factor when dealing with the astigmatic cases or the higher degrees of simple hypermetropia. If the time for re-examination is fixed at longer than one year, or left to the discretion of the child or parent, it then only too frequently happens that the child is not seen again; it is too long an interval to keep in touch with them; they either forget to return, break their glasses and do not trouble to get them repaired, go to some other district, or leave school. When first treatment was undertaken by the London County Council little was done about after-treatment; there was no efficient following up of the cases; so that, although I told nearly all my cases examined in the first six months to return for re-examination at varying periods up to one year, as a matter of fact only 95 out of 391 who had been ordered glasses did return by the end of the first year. Some of these absconders have since been hunted up, and it is to some extent on the experience gained in re-examining them that I was impressed with the necessity of re-examining all who had been prescribed lenses within the year, according to the plan I have previously given in detail, for the majority of these absconders either had lost their spectacles, broken them, or, in the case of some of the myopes, their defect had increased.

I am glad to say, however, that much of the difficulty in getting these children up for re-examination has now been overcome, thanks to the untiring zeal and patience of the London County Council Care Committees, so that during last year and the present year there has been a steady increase in the number of those treated who have returned for re-examination at the scheduled time.

Of the 1,305 children under review 726 were girls and 579 boys. Their ages ranged from 4 to 14 years.

Table showing Percentage of Girls and Boys for the Respective Ages.

Age.	No. of Girls.	Percentage.	No. of Boys.	Percentage.	Total.
4	16	1.22	7	0.53	23
5	32	2.45	21	1.60	53
6	41	3.14	29	2.22	70
7	62	4.75	33	2.52	95
8	96	7.35	95	7.27	191
9	84	6.43	51	3.90	135
10	62	4.75	50	3.83	112
11	95	7 27	83	6.36	178
12	156	11.95	126	9.65	282
13	73	5.59	71	5.44	144
14	9	0.68	13	0.99	22
Total..	726		579		1,305

Of these 1,305 children sent for treatment, 1,186 had their refraction estimated, 1,118 of whom were ordered correcting lenses.

Table of Refractive Errors and Percentage of the Total Number for Each Class.

	Number.	Per Cent.
Simple hypermetropia	234	19.73
Simple hypermetropic astigmatism ...	65	5.44
Compound hypermetropic astigmatism	530	44.68
Simple myopia	90	7.58
Simple myopic astigmatism	1	0.08
Compound myopic astigmatism ...	96	8.09
Mixed astigmatism	153	12.90
Anisometropia	13	1.09
Isometropia	4	0.33
Total	1,186	—

Table showing Other Defects, either as Accompanying the above Cases of Errors of Refraction or Accounted for among the Remaining 119 Cases of the 1,305 dealt with.

Defect.	No.	Defect.	No.
Strabismus—		Corneal phlyctennles ...	6
(*a*) Concomitant	185	Nebulae	59
(*b*) Paralytic	4	Leucoma adherens... ...	3
Hyperphoria	3	Ectasia corneae	1
Ptosis—congenital	2	Irido-cyclitis...	1
Nystagmus—		Cataract	6
(*a*) Lateral	6	Optic atrophy, secondary	2
(*b*) Rotatory	3	Detached retina	1
Chronic dacryocystitis ...	2	Retinitis pigmentosa ...	2
Conjunctivitis	68	Hereditary syphilitic choroiditis	3
Orbital cellulitis	1	Tuberculous choroiditis...	3
Trachoma	1	Albinism	4
Chalazion	4	Phthisis bulbi	1
Blepharitis	37	Malingerers	2
Interstitial keratitis	3	Emmetropia	14
Phlyctenular keratitis ...	10		

Table of Cases of Concomitant Strabismus.

There were 185 cases in all, of which 100 were girls and 85 boys; in 63, or 34.05 per cent., of these cases the squinting eye was amblyopic.

Alternating convergent strabismus	51
Right convergent strabismus	49
Left convergent strabismus	75
Alternating divergent strabismus	4
Right divergent strabismus	3
Left divergent strabismus	3
Total	185

Table of Cases of Convergent Strabismus for each Age (Number and Sex).

Age:	4	5	6	7	8	9	10	11	12	13	14	Total.
Girls	5	15	10	11	13	7	9	5	13	4	2	94
Boys	—	6	14	8	21	7	6	5	8	3	3	81
Total ...	5	21	24	19	34	14	15	10	21	7	5	175

Table of Cases of Amblyopic Squints (Number and Sex).

Age:	4	5	6	7	8	9	10	11	12	13	14	Total.
Girls	—	2	4	4	3	3	5	1	4	2	1	29
Boys	—	1	3	4	9	4	3	1	5	3	1	34
Total ...	0	3	7	8	12	7	8	2	9	5	2	63

I have also more closely analysed the myopic cases, among which I include cases of mixed astigmatism. Under this classification there were 340 cases, of which 183 were girls and 157 boys.

Table of the Myopes for each Age (Number and Sex).

Age:	4	5	6	7	8	9	10	11	12	13	14	Total.
Girls	—	2	4	13	24	18	14	34	45	26	3	183
Boys	—	—	3	8	17	8	15	29	41	30	6	157
Total ...	0	2	7	21	41	26	29	63	86	56	9	340

The number of cases recorded for age 14 is small, and is accounted for by the fact that 14 is the age at which the child may, and unfortunately generally does, leave school. The more or less progressive increase in the number of myopes for each age will be noted.

I had tabulated the schools from which these myopes were recruited, but the total number attending any one school was too small for any accurate conclusion to be drawn therefrom.

The two following tables deal respectively with the vision recorded before and after treatment in 397 cases, or all those of the 1,118 ordered glasses that returned for re-examination:

Vision before Treatment.

Right Eye.	Left Eye. 6/60	6/36	6/24	6/18	6/12	6/9	6/6	Total.
6/6	1	4	3	3	1	1	2	15
6/9	2	—	1	5	9	22	4	43
6/12	2	5	4	16	41	13	—	81
6/18	3	7	8	31	20	2	1	72
6/24	5	9	32	21	13	2	3	85
6/36	4	19	18	8	4	3	1	57
6/60	25	8	5	2	4	—	—	44
Total	42	52	71	86	92	43	11	397

Vision after Treatment.

Right Eye.	Left Eye. 6/60	6/36	6/24	6/18	6/12	6/9	6/6	Total.
6/6	2	3	1	2	10	16	93	127
6/9	—	1	—	4	16	98	25	144
6/12	1	—	1	10	53	15	9	89
6/18	—	—	1	8	7	2	1	19
6/24	—	—	2	1	1	2	2	8
6/36	—	1	1	—	—	4	2	8
6/60	—	—	—	—	1	1	—	2
Total	3	5	6	25	88	138	132	397

I am indebted to Messrs. Lang, Treacher Collins, and Hepburn for kindly permitting me to publish this report.

TRANSITORY BIGEMINAL PULSE.

BY

SIR LAUDER BRUNTON, BART., M.D., F.R.S.,

CONSULTING PHYSICIAN TO ST. BARTHOLOMEW'S HOSPITAL.

IN relation to the case of abnormal pulse rhythm described by Dr. Johnstone in the BRITISH MEDICAL JOURNAL of October 5th, it may be interesting to record the occurrence of a bigeminal pulse without any apparent cause other than the slight excitement of applying the sphygmograph.

The patient was a young man, aged 19, who had been suffering from albuminuria for more than two years; he also had enlarged glands behind his sterno-mastoids, in the axillae and left groin. The pulse was small, soft, and regular. The tension was only 97. The urine contained a few swollen renal cells, very few casts, and no crystals. With the exception of slackness he had no symptoms, and when excited showed considerable activity and would play four sets of tennis one after the other. He had no other complaint.

I saw him last on September 23rd and found his systolic tension 108 and the diastolic 60. The cardiac dullness and sounds were perfectly normal. There was still a large amount of albumen; he had several glands in the back of the neck, in the groins, and in the front of the abdomen. His pulse was quite regular, but while I was taking it it assumed a bigeminal character, as is shown by the accompanying tracings, which were taken without removing the sphygmograph from the arm.

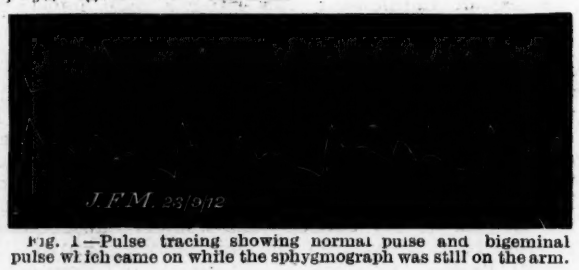

Fig. 1.—Pulse tracing showing normal pulse and bigeminal pulse which came on while the sphygmograph was still on the arm.

It is difficult to explain the exact causation of this alteration in the pulse beat, but it gives me the impression of being due to the interference of two rhythms. We

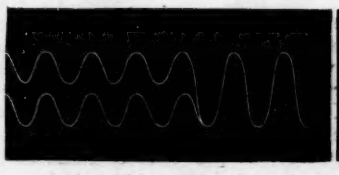

Fig. 2.—Diagram showing increase of sound or light by coincidence of waves.

Fig. 3.—Diagram to show abolition of sound or light by interference of waves.

know that sounds or lights generally strengthen each other so as to cause a brighter light or a louder sound

because the waves of which light and sound are composed become superimposed one upon another, as in Fig. 2. But if, by chance, one sound or one light is thrown half a wave length behind the other, the two sounds make a silence, and once when I was a student in 1862 I actually saw the late Professor P. G. Tait of Edinburgh show the experiment of two lights making darkness (Fig. 3). When two rhythms do not quite coincide, beats of alternate strength and weakness are produced, as shown in Fig. 4,

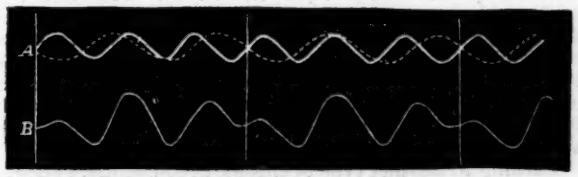

Fig. 4.—Diagram to show the effect of interference of waves of different wave lengths. The two systems having a relation of about 4 to 7 are shown above, and their resultant below. (From Ganot's *Physics*.)

and I think that in Dr. Johnstone's case and mine the peculiar rhythm of the pulse was due to the partial interference of two rhythms—muscular or nervous, or both—though the exact *modus operandi* may require a prolonged investigation and discussion.

EIGHTIETH ANNUAL MEETING

OF THE

British Medical Association.

Held in Liverpool on July 19th, 20th, 22nd, 23rd, 24th, 25th, and 26th.

PROCEEDINGS OF SECTIONS.

SECTION OF OPHTHALMOLOGY.

Edgar Athelstane Browne, M.Ch., President.

PRESIDENT'S INTRODUCTORY REMARKS.

Mr. Edgar Browne limited his introductory remarks to an expression of welcome to those present, and a few references to the work to be performed, and then called for the opening of the first discussion.

DISCUSSION ON CHRONIC IRIDO-CYCLITIS.

OPENING PAPERS.

I.—George Coats, F.R.C.S.,

Assistant Surgeon, Royal London Ophthalmic Hospital.

It is not my purpose to attempt a review of all the forms of chronic irido-cyclitis, but rather to select a few points here and there in order to elicit opinions on them. First, I should like to examine some recent views on autointoxication in relation to eye disease; I shall then speak of the exceedingly chronic form of cyclitis which is associated with heterochromia and cataract. Afterwards I shall mention briefly one or two points in connexion with sympathetic ophthalmitis.

A marked tendency of recent opinion is to seek the cause of chronic irido-cyclitis in poisoning either from a septic condition of the teeth, or from an abnormal state of the intestinal canal. The first of these I shall not discuss, as I believe Mr. Ormond intends to deal with it. The second, autointoxication from the intestinal tract, has been the subject of a good deal of discussion in recent years. Obviously the explanation must be received with a good deal of circumspection, for it is one which can be assumed in almost any case, and positively disproved in almost none. An evident fallacy lies in the great prevalence of constipation and intestinal putrefaction, which would render their association with irido-cyclitis in a certain number of cases not surprising, even although, in fact, no connexion existed between the two.

It may be asked, If intestinal putrefaction is the cause of irido-cyclitis why is the one so common and the other relatively so rare? This point, however, does not really tell against the explanation, for there are many instances in pathology to show that the condition of the tissues as regards resistance may be as important as the presence of the poison; even if irido-cyclitis were caused by intestinal putrefaction therefore we should not expect it to occur in every instance of that condition, any more than we should expect every one who swallows tubercle bacilli to become tuberculous. On the other hand, it would obviously tell against the autointoxication hypothesis, or at least against its universal application, if cases occurred in which there was no intestinal putrefaction. It would be interesting to hear the experience of members on this point. One meets sufficiently frequently with cases of chronic irido-cyclitis in which there is no constipation, but then an absence of constipation does not necessarily imply an absence of intestinal putrefaction. I can quote one case of typical chronic cyclitis, however, in which a careful examination of the faeces by Dr. S. H. Browning, both with regard to the completeness of digestion and the presence of an abnormal bacterial flora, was quite negative. The patient also had no pyorrhoea, the Wassermann reaction was negative, and his general health was quite good.

It would be a desirable link in the chain of evidence if the same microbe could be cultivated from the eye and from the faeces, or should this be too much to expect, if clear evidence could be brought forward of improvement in the eye condition under the use of a vaccine prepared from the faecal flora.

In recent years an attempt has been made to approach this question from a more scientific standpoint. One of the results of intestinal putrefaction is the excessive production of conjugate, or ethereal sulphates — combinations of sulphuric acid with organic radicles. To a member of this group—indoxylsulphuric acid—the name "indican" has been given, because indigo blue can be formed from it by means of agents which free and oxidize the indoxyl (Jaffé's test, Obermeyer's test). Minute traces of these substances are found in the normal urine, but it has been suggested that a persistently increased reaction may be a valuable indicator of the presence of intestinal putrefaction. It is not suggested that the sulphates themselves cause autointoxication; indeed, it does not seem to have been proved that any of the known products of intestinal putrefaction give rise, when injected experimentally, to symptoms analogous to those usually attributed to autointoxication.

Using this reaction, and also the therapeutic test of improvement with suitable treatment, Elschnig has sought to prove that enterogenous autointoxication plays a part not only in chronic irido-cyclitis and recurring iritis, but also in migraine, marginal ulcer, scleritis, episcleritis, occasional cases of glaucoma, and possibly some instances of post-operative infection, choroiditis, cataract, and recurring hordeolum. De Schweinitz supports some of these claims, and discusses the influence of intestinal catarrh on the etiology of tobacco amblyopia. On the other hand Uhthoff, writing earlier than these authors, takes a much more conservative view, and considers that the influence of autointoxication has been proved only for cases of paralysis of the ocular muscles, especially the ciliary muscle, as, for instance, in paralysis of accommodation from ptomaine poisoning.

In a recent work also v. Hippel attacks Elschnig's conclusions. He states that it is not universally agreed that indicanuria is evidence of autointoxication. Among 416 miscellaneous cases 16 gave a positive indican reaction, and most of these positive results occurred in patients suffering from a variety of conditions—wounds, ulcers, etc.—with which autointoxication can have no causal relationship; in two cases, one of scleritis and one of irido-cyclitis, in which the reaction was positive, a tuberculous etiology was almost certain. In considering these results it is to be remarked, in the first place, that 16 positive reactions out of 416 is not a very large number. If it could be shown that in chronic irido-cyclitis the

positive percentage is much higher, then v. Hippel's figures would only prove that the test is fallible, not that it is of no value. On this point, however, there is a discrepancy of evidence.

Again, even admitting the significance of indicanuria as a test of intestinal putrefaction to be disproved, it would not necessarily follow that intestinal putrefaction does not occur, or that it is not a cause of chronic cyclitis; one link of the proof fails, but the association may yet be real enough. There would still remain the therapeutic test of improvement with suitable treatment—dieting, calomel, and guaiacol carbonate according to Elschnig's prescription. The snares and pitfalls of this test, especially in the hands of the irresponsible optimist, are notorious, but without doubt some of our senior members of large experience could give us valuable information on the subject.

A form of cyclitis of extremely chronic type is that in which keratitis punctata is associated with heterochromia and cataract, the keratitis punctata and lens opacity being found always in the lighter-coloured eye. The condition has recently been the subject of a searching analysis by Fuchs, who points out that (*a*) either the iris may become bleached in consequence of the cyclitis, or (*b*) the blue colour of the iris may be the primary phenomenon and the cyclitis and cataract secondary. The first of these explanations he rejects on the ground that case histories and actual observation prove the blueness of the iris to be, in fact, antecedent to the cyclitis.

With regard to the second hypothesis (*b*) there are several possibilities: (1) The heterochromia may be a pure *lusus naturae*, or (2) it may be due to some unknown cause which prevents the normal acquisition of pigment by the originally blue infant's eye; such a congenitally abnormal eye might offer a diminished resistance to circulating noxae—or rather, one must say, considering the very characteristic type of the disease, to some specific noxa. It has yet to be proved, however, that blue eyes—or the blue eye in cases of true congenital heterochromia—show any special proclivity to be attacked by cyclitis or cataract. (3) Another possible hypothesis, and one which is favoured by Fuchs, is that some cause unknown first hinders the normal acquisition of pigment, and then in later life gives rise to cyclitis; the cause in question must be a noxa of slight intensity whose action commences in infancy and continues over many years; it must have a special predilection for the anterior part of the uveal tract, and in almost all cases it affects one eye only. The cataract seems to be a relatively late, and probably secondary, phenomenon.

If a word of criticism might be ventured on this analysis, it is that perhaps Fuchs dismisses too summarily the hypothesis of a primary cyclitis of which the bleaching is only a manifestation. It is admitted that the onset of the disease is extremely insidious, with no external congestion, and for a long time with but little visual defect; moreover, the keratitis punctata is easily overlooked except on the most careful examination, or may indeed be absent altogether, the only evidence of cyclitis being vitreous opacity; in these circumstances it is necessary to exercise much caution in fixing the date of commencement of the condition, and the statement by patients that the eye was blue before the vision became defective is not necessarily of much value. In the youngest case (13) observed by Fuchs keratitis punctata and cataract were already present. Again, although it may be true, as Fuchs states, that the heterochromia usually dates from early childhood, yet cases occur in which it is first noticed in later life—even after the vision has begun to fail; moreover, in some instances the heterochromia is said to have increased under observation. It must be confessed also that it is difficult to form a clear conception of a noxa which first, without any inflammation, causes a natural process of pigmentation to remain in abeyance, and then, it may be many years later, gives rise to an actual inflammation, slowly progressive and intractable to treatment. It would not be easy to point to any analogous phenomenon in general pathology.

On the other hand, bleaching of the iris is a well-known concomitant of various processes of inflammation and degeneration, as, for instance, after interstitital keratitis and in glaucoma of long standing. The cases of heterochromia which were examined by Fuchs, moreover, showed not a mere absence of iris pigment, but an abnormal condition of it—loss of the branched form of the chromatophores, and the presence of fine granules between the cells. In some instances, also, the lack of pigment is by no means complete, both eyes being brown, but one lighter than the other.

On these grounds, therefore, it is perhaps more probable that the process is primarily a cyclitis of a very insidious and chronic type which is associated with bleaching of the iris and with the formation of a secondary cataract. Histological researches have not so far elucidated the etiology of the condition. In addition to the changes in the chromatophores mentioned above, Fuchs found a transformation of the iris stroma into a more fibrillar type of tissue and an infiltration with mononuclear elements, probably derived from the stroma cells; lymphocytes were rare and polymorphonuclear cells absent; the vessel walls were thick and hyalin.

Turning to another type of chronic irido-cyclitis, I should like to raise for discussion one or two questions in connexion with the pathology of sympathetic ophthalmitis. I shall not enter into a discussion of theories, but shall take for granted two points which modern research seems likely to establish—that the disease is due to a living organism, be it bacterium or protozoon, and that this organism reaches the second eye, not by the nerves or orbital veins, but by the general circulation. This latter statement involves the doctrine of a specific affinity of noxae towards certain tissues; just as the poison of strychnine comes into contact with all the organs of the body, but finds its specific affinity only in the central nervous system, so, it may be supposed, the poison of sympathetic ophthalmitis also circulates everywhere, but finds its specific affinity only in a tissue which has the same constitution as that which was the seat of its original activity—namely, in the uvea of the other eye.

The exact nature of the causative organism, it need scarcely be said, is entirely a matter of speculation. Direct cultivation from the eye has failed totally, and the report by Nedden of the recovery of a diphtheroid organism from the blood does not seem to have been accepted as convincing or to have been verified. Recently Price-Jones and Browning, confirming an observation of Gradle, have described an increase in the large mononuclear cells of the blood, and have put forward the suggestion, on the analogy of the blood condition in syphilis, that this may indicate a protozoal infection as the cause of sympathetic. Some other considerations might have been added. The incubation period of sympathetic, for instance, is unlike that of most ordinary bacterial infections, but in the majority of cases is closely similar to that of syphilis; another point of resemblance is the occasional faculty which the noxa of sympathetic possesses of remaining latent over a prolonged period and then breaking out into activity—a faculty which suggests an analogy with the similar latency and recrudescence of the *Spirochaeta pallida* in the tertiary stage of lues. On the other hand, the histological structure characteristic of sympathetic is more nearly allied to that of the bacterial infection tubercle than to that of the protozoal infection syphilis; tubercle also is an example of a bacterial infection with a prolonged incubation period, so that with regard to these points the evidence for a bacterial *versus* a protozoal origin is inconclusive.

As a logical outcome of their speculations, Price-Jones and Browning recommend the treatment of sympathetic with salvarsan. The discussion of this subject will be more in place at a subsequent meeting, but perhaps I may be permitted to refer very briefly to three cases which have come under my notice.

The first was one of great severity, which only came under my care in a late stage; in this instance salvarsan had but little influence on the course of the disease. In the second, sympathetic followed an extraction with loss of vitreous. On the earliest appearance of a spot or two of keratitis punctata in the second eye, and before there was any trace of congestion, the eye which had been operated on was removed. In spite of this, however, sympathetic ophthalmitis of a severe and threatening type developed. Three weeks after its onset an injection of 0.5 gram of salvarsan was given. As no great improvement resulted, a second, larger, dose (0.6 gram) was given three weeks later. An immediate and remarkable amelioration followed this injection; within a few days the pericorneal congestion had subsided, and the vascularity and thickening of the iris had practically disappeared; the vitreous could not be examined

owing to lens opacity. The eye has remained quite free from congestion ever since (six months), and the pupil is widely dilated, but for a long time the keratitis punctata remained as abundant as ever. Now it seems to be gradually disappearing.

In the third case the sympathetic followed an injury, and was of moderate severity. A first dose (0.5 gram) of salvarsan, administered seventeen days after the outbreak of the disease, produced comparatively little effect; a second (0.5 gram), given a fortnight later, was followed by bleaching of the pericorneal congestion, which, however, gradually returned; a third dose (0.45 gram), three weeks later, resulted in a still more decided subsidence of congestion; the media were still too hazy to permit of a clear view of the fundus. There is still a little pericorneal flush and some keratitis punctata.

It is evident that a great many more observations are required on this subject. In none of my three cases could it be said that the disease was cured by salvarsan, but in the second especially the improvement in an exceedingly threatening condition was very remarkable. Considering the gravity of sympathetic and the usual inefficiency of the ordinary methods of treatment, which were applied according to rule in the above cases, a more extended trial of salvarsan seems to be fully justified.

So far I have taken it for granted that sympathetic ophthalmia is due to a micro-organism. This assumption, however, has been called in question recently by Elschnig, who attributes the disease to anaphylaxis, and as some of his speculations are applied also to irido-cyclitis in general, it may be worth while to submit them to a brief examination. If a small quantity of a foreign substance, not necessarily a poison—egg albumen, for instance—be injected into the circulation of a guinea-pig, a hypersensitive condition towards that substance is induced, so that a subsequent injection of a much smaller dose of the same material may produce severe or even fatal symptoms. This hypersensitive condition is anaphylaxis.

Elschnig's application of these facts to the explanation of sympathetic may be stated briefly as follows: By the breaking down and resorption of uveal tissue, and especially of pigment, in the injured eye, a hypersensitiveness of the body generally, and more particularly of the homologous organ, the other eye, is produced. The second eye is therefore more vulnerable, and if there be any constitutional anomaly — for example, nephritis, diabetes, autointoxication, etc.—or if any minute lesion leading to the breaking up of even a single cell occur in this eye, then inflammation will be precipitated in the hypersensitized organ. Two things, therefore, are necessary to the occurrence of sympathetic—a hypersensitive condition of the tissues, and a constitutional anomaly.

Even in non-sympathetic cases the same factors may be at work; Elschnig finds that bilateral irido-cyclitis leads to total blindness of the affected eyes much more frequently than unilateral; he attributes this to the pigment absorption of the first affected eye causing a hypersensitive, anaphylactic condition of the second, so that in a sense all bilateral cases of irido-cyclitis are instances of sympathetic.

These views have undergone some damaging criticisms at the hands of v. Hippel. He points out that if a constitutional anomaly is required, then sympathetic could not occur in a perfectly healthy person. But in fact anaphylactic phenomena do not require any constitutional anomaly for their production, but can be induced in perfectly healthy animals. V. Hippel seems to be wrong in stating that anaphylaxis is a condition of the body generally not producing local inflammations; local inflammations of this type occur in the skin; and the recent work of Kümmell and others shows that they may occur in the eye. Whether or not these researches confirm the views of Elschnig it seems likely that many new and interesting facts will be obtained by such studies. Anaphylaxis is a protective reaction of the body to foreign substances; it is doubtful if it occurs from the absorption of autogenous products such as the uveal pigment of the same individual. (Recent researches, however, seem to prove that this type of auto-anaphylaxis is in fact possible.) If it could be induced by autogenous pigment in this way then it ought to occur in other conditions where there is free breaking down of the uveal tissues—for instance, in bullet wounds of the orbit close to the eye, choroido-retinitis, etc.—conditions in which sympathetic never does occur.

According to Elschnig the cause of the disease in the two eyes of a bilateral case of non-sympathetic irido-cyclitis is different—in the first a constitutional anomaly, in the second anaphylaxis; if, however, a constitutional anomaly is sufficient for the first eye there seems no reason why it should not also be sufficient for the second.

But even supposing it to be fully proved that injury of one eye produced an anaphylactic state of hypersensitiveness in the other, it would still be necessary, I think, to postulate a specific organism as the cause of sympathetic. It is true, no doubt, that the clinical and pathological features of sympathetic are not absolutely characteristic to the extent that no other disease ever imitates them—the same might be said of tubercle or syphilis; but they are quite sufficiently characteristic to make the assumption of a specific organism in the highest degree probable. It is incredible that so well-defined a clinical course, and such constant histological changes should be produced indifferently by nephritis, diabetes, autointoxication, or other constitutional anomalies. On these and similar grounds, therefore, pathologists will probably not be satisfied with a physico-chemical explanation, but will continue the search for the specific organism of sympathetic.

There is another point in connexion with sympathetic on which the experience of members would be welcome—namely, the occurrence of very mild cases. I do not refer to cases such as one occasionally sees, in which, after a period of grave anxiety, the eye finally does well, but to cases in which from first to last the symptoms are trifling—perhaps only a spot or two of keratitis punctata without congestion or other evidence of iritis. It will naturally be asked, Are these mild cases really instances of true sympathetic? and this will lead to the further question, Have we any pathological criterion whereby a certain diagnosis of that affection can be arrived at?

Taking the second question first, the best delineation and critical analysis of the histology of the sympathetic infiltration is that of Fuchs. The cells which take part in it are on the whole the same as in tuberculous granulomata—lymphocytes, epithelioid cells, and giant cells—but mixed up together in irregular strands and tracks rather than disposed with any regularity in tubercle systems. With these there is a more or less characteristic distribution—in the posterior layers of the iris, in the outer part of the inner zone of the ciliary body, and in the outer layers of the choroid. The infiltration may cause considerable thickening of these parts, but has comparatively little tendency to transgress their limits and form fibrino-plastic exudations in the vitreous, etc.

My own experience of the diagnostic value of these lesions, drawn from the examination of a very considerable number of eyes, both exciting and sympathizing, is as follows:

1. Perhaps the most characteristic feature of all is the widespreadedness of the infiltration. Usually the whole of the uvea is involved, and I should fully agree with Fuchs that cases in which the choroid is quite free scarcely occur. In this respect sympathetic stands in marked contrast with infective iritis, in which the most severe infiltration of the iris is often associated with total exemption of the choroid. The patchiness of the infiltration is also very characteristic of sympathetic, at least in its early stages.

2. Cases of true sympathetic undoubtedly occur which could not be diagnosed by the histological characters of the infiltration alone, in which the exudation in the uveal tract consists chiefly of plasma cells and lymphocytes. I have met with these cases chiefly in sympathizing eyes.

3. On the other hand, if the changes described by Fuchs are present in typical form and distribution, there is scarcely any possibility of error. Practically the only source of confusion is tubercle, in which, indeed, the histological resemblance to sympathetic may be very great. A few cases of idiopathic irido-cyclitis with the histological changes of sympathetic have been described by Continental writers. They must be very rare; I have not met with an instance which would mislead any one who had some experience in examining cases of genuine sympathetic. In both these instances, however, a reference to the clinical history will practically always exclude the possibility of a mistake.

Where there is a history of injury, therefore, and where the changes described by Fuchs are typically present, the diagnosis of sympathetic can be made with the utmost confidence. This was exceedingly well illustrated in a

case which came under my observation. On examining an eye lost after extraction, which was sent to me in the ordinary way, the typical changes above described were found; when the patient left hospital, the second eye was normal, but further inquiry showed that three weeks later he was readmitted with a well-marked attack of sympathetic.

In the case just mentioned the sympathetic was severe. In the following case, although the histological changes were typical, the inflammation in the second eye was very slight:

Six weeks after an injury causing a rupture of the globe, the other eye became slightly flushed, and there was some recent keratitis punctata in it; pupil active. Vision $\frac{6}{9}$. The injured eye having been excised, the flushing of the other subsided within a week, and three weeks later the keratitis punctata had entirely disappeared; tension normal; media clear; fundus normal. In a second case of the same kind the histological changes in the excised eye were not quite so typical. Two months after an injury with an air-gun pellet, fine keratitis punctata appeared in the other eye; no injection, iris bright, pupil active. The injured eye was excised, and thirteen days later only two spots of keratitis punctata were present in the other eye, which had remained quite quiet in the meantime; a month later these also had disappeared.

In the first of these cases especially, therefore, there was good pathological evidence that the affection, although so mild, was genuine sympathetic. Have other members experience of similar cases?

I am conscious that in these remarks I have rambled rather freely, picking out a point here and there, and leaving unmentioned large divisions of the subject, which are quite as worthy of discussion. But, in the first place, it is seemly that I should leave something for my friend Mr. Ormond, and, in addition, I hope there is no rule of the Association which confines discussion to the subjects broached in the opening papers.

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II.—A. W. ORMOND, F.R.C.S.,

Ophthalmic Surgeon, Guy's Hospital.

THAT syphilis is a direct and primary cause of a large number of cases of iritis will not, I think, be disputed by any; the frequent occurrence of iritis in the secondary stage of syphilis, its well-known clinical features, its reaction to antisyphilitic remedies, and the finding of the *Spirochaeta pallida* in the aqueous and iris tissue, leave no room at all for doubt. The evidence that gonorrhoea is a cause of iritis and that the gonococcus will grow in the uveal tissue is also conclusive, and the same certainty exists about tubercle. Syphilis, gonorrhoea, and tubercle, then, are undoubted causative factors of iritis and irido-cyclitis.

Among other certain causes of iritis, although rarer and less well known, are leprosy and malaria. In addition to these the meningococcus, staphylococcus, and *Bacillus typhosus* have been isolated from the iris or anterior chamber in cases of iritis. In order to limit the discussion of the etiological factors of iritis to a somewhat reasonable extent, I have omitted all reference to diabetes and Bright's disease, as I wish to give most of the time allotted to me to the discussion of rheumatism and gout as etiological factors in iritis. We are at present ignorant of the primary cause of both gout and rheumatism. Messrs. Poynton and Payne have isolated a micrococcus from cases of acute rheumatism, and it is possible that a streptococcus frequently present in the body may under certain conditions be the cause of rheumatic fever; but the certain isolation of the specific organism is not yet conclusively accomplished. It is consequently difficult to arrive at a definite conclusion as to the etiology of cases of iritis supposed to be due to rheumatism, because there is as yet no available scientific proof. If the clinical associations are definite, we say the iritis is due to rheumatism, but it becomes necessary to examine this clinical evidence very carefully in order to answer the question, Is rheumatism a cause of iritis?

I asked my colleague, Dr. Rippmann, the Medical Registrar of Guy's Hospital, to let me know the number of cases of acute rheumatism treated in the hospital during the last ten years. They number 1,163, an average of 116.3 a year. There are in London twelve large hospitals and thirty Poor Law infirmaries. If one institution with about 600 beds averages 116 cases of acute rheumatism a year, and there are in London alone over forty other institutions which would also receive their share of such cases, besides those patients treated privately, it must be allowed that the number of cases of rheumatic fever treated annually in England alone must number many thousands.

As far as I know, only two observers have published cases of iritis directly associated with acute rheumatism. It is possible that others have seen cases but have not published them; still the coincidence of iritis with acute rheumatism is so rare that it does not shake my belief that acute rheumatic fever must not be looked upon as an etiological factor in iritis; and I am the more confident of this in remembering that the advocates of rheumatism as a cause of iritis and irido-cyclitis have been challenged to produce their proofs for a sufficiently long time to enable them to do so, if indeed they possessed any. In Mr. Forster's case it is acknowledged that tonsillitis existed, and I would suggest that the case is not only rare on account of its supposed etiology, but also in the fact that it occurred in a child of 12 years. The case cleared up entirely, but Messrs. Poynton and Payne, in their communication to the Ophthalmological Society in 1903, speak of it as being of unusual severity, and add significantly, "such examples as we have seen have been very transient," clearly indicating that the clinical aspect of these cases differs very markedly from the intractable case of irido-cyclitis usually designated "rheumatic."

When we consider the tens of thousands of cases of acute rheumatic fever treated all over the civilized world during the last ten years, the amount of evidence to prove an association between rheumatism and iritis is practically *nil*.

With regard to chronic and subacute rheumatism, the proof that rheumatism in this form is not a causative factor in the production of iritis is more difficult, but I think it is nevertheless conclusive. The case may be stated thus: A patient having had an undoubted attack of acute or subacute rheumatism, is found some time afterwards to have an arthritis of one or more joints, and later on iritis develops in one or both eyes. Is the etiological factor producing the iritis really rheumatism? Rolleston, in his Hunterian lectures on "Acute Arthritis of Doubtful Origin," quotes cases in which a primary rheumatic synovitis became complicated by a secondary infection, such as tubercle, syphilis, etc., and also cases in which the joint trouble of patients suffering from acute arthritis was shown to be due to *Bacillus coli*, syphilis, tubercle, typhoid bacillus, or acute periostitis, and concludes that acute arthritis may be a manifestation of various diseases.

I have notes of a case of a patient who was sent to Guy's Hospital with a history of rheumatic fever; during convalescence a suppurative irido-cyclitis developed. On careful examination it proved to be a case of acute periostitis of the humerus with a metatastic deposit in the uveal tract leading to phthisis bulbi.

Acute rheumatism, then, is frequently simulated by various diseases which are not rheumatic in origin at all. The chronic arthritis which sometimes follows attacks of acute rheumatism have in some instances been proved to be due to a secondary infection. As Rolleston points out, a patient who has oral sepsis may recover from the rheumatic attack and subsequently suffer from arthritis due to infection derived from the mouth. It is also a fact that irido-cyclitis which is said to be of rheumatic origin seldom shows any permanent reaction to the use of salicylates such as we are accustomed to see in treating true rheumatism, or as we see when treating syphilitic cases with mercury, and the slight improvement which is sometimes found may be fairly attributed to the diaphoretic action of the drug.

It is generally agreed that rheumatic fever never induces

fibrous ankylosis; such a condition when found in association with iritis should cast a doubt as to the likelihood of the cause being rheumatism. Chronic rheumatism is a clinical entity described with unvarying regularity in the textbooks, but with most unconvincing evidence of its etiology. Take, for instance, Professor Osler's account. He says: "In my experience it is extremely rare as a sequence of acute rheumatism"; and again, "the salicylates are useless"; and again, "the majority of cases resist all treatment; it is a disease, however, which persists indefinitely." That Professor Osler is describing a definite clinical entity is certain, but that that entity has the *Streptococcus rheumaticus* as its etiological factor is by no means proved. I do not assert that the *Streptococcus rheumaticus* is incapable of producing a chronic arthritis, although many writers have suggested that where an attack of rheumatic fever is followed by a chronic arthritis in one or two joints the arthritis is really due to secondary infection and not to the *Streptococcus rheumaticus*, but what I can assert is that in my experience the evidence of true rheumatism in a case of irido-cyclitis is so rarely obtained as to justify scepticism as to whether rheumatism ever does produce iritis in clinical medicine. I am aware of Messrs. Poynton and Payne's experiments on animals and also of Messrs. Ainley Walker and Beaton's failure to verify their results, but even allowing that iritis can be produced by injection of large quantities of streptococci, it does not prove that this occurs in ordinary everyday medicine.

If we remember the hundreds of cases of rheumatism treated annually in the British Isles and the complete absence of iritis in association with the disease in its acute and most virulent stage, I am myself of the opinion that where iritis seems to have occurred in connexion with the *Streptococcus rheumaticus* it really results from a secondary infection from possibly the mouth, tonsils, nose, intestinal tract, or elsewhere.

Gout as a causative factor of iritis has, in my opinion, still less to recommend it. Dr. Luff defines gout as the manifestation of a number of morbid tendencies, some of which may be inherited and some acquired. If the joints are affected, articular or regular gout results; if other organs or tissues are affected, then irregular gout is produced. He continues:

> It is a disease which is due to faulty metabolism, probably both intestinal and hepatic, as the result of which some toxin or toxins are produced and lead to an autointoxication, which is a factor in the development of the gouty conditions. This autointoxication coincides with or is followed by, in the majority of cases, a deposition of sodium biurate in certain of the joints or tissues which constitute the cause of the gouty attack. I cannot but think that, with our increasing knowledge and experience of the disease, uric acid and its salts will in all probability have to be relegated to a position of subsidiary importance in the pathogenesis of gout.

Later on, in the same book (*Gout*, 1907), Dr. Luff says:

> In my opinion the view that a bacterial toxin is the primary cause of gout is the most probable one.

As far as I know, there is no authority for suggesting that gout manifestations are due to the presence of micro-organisms in the joints and tissues themselves, only that toxins elaborated by bacteria in the alimentary canal may be the cause.

If, then, gout is to be accepted as a causative factor in iritis, we must allow that a toxin circulating in the blood is able to cause an inflammation of the iris tissue. But there is no evidence in support of such a contention. If toxins derived from a remote source could produce iritis, surely cases of iritis should be markedly on the increase, since the injections of serum, antitoxins, etc., are so widely prevalent; I do not know of a single case of this nature having been recorded.

Axenfeld is quite clear on this question. He says, "We cannot infer in an endogenous purulent inflammation that the toxins which are circulating in the blood have settled down at one spot; the hypothesis that a microbe-free metastatic ophthalmia exists is quite without proof." And again, "There is no proof (however) that the circulating toxins of the organisms can produce any localized inflammation in the eye."

The fact that in this or that case no organism could be found in the aqueous removed from the anterior chamber does not allow us to conclude that the cause is toxic, because the germs may be in the iris tissue, or may die out in the exudates, or may not have been sufficiently carefully transferred to the culture media. It is an undoubted fact that organisms directly transferred to the interior of the globe produce much more violent reaction than when injected into the veins, probably owing to the presence of protecting substances in the blood. Virulent pathogenic organisms often produce very mild non-purulent inflammations when metastatically deposited in the uveal tract.

If gout is to be considered a causal factor in iritis, the possibility of a toxin producing a definite local inflammation of the eye must be proved.

I believe iritis and irido-cyclitis to be due invariably to the presence of micro-organisms in the uveal tissue. Some organisms have a preference for certain tissues, and rarely, if ever, affect others—as, for instance, the mucous membrane of the lacrymal sac is immune to the gonococcus and Koch-Weeks bacillus. I should say that the uveal tract is very susceptible to invasion by the *Spirochaeta pallida*, tubercle bacillus, and gonococcus. Various cocci, also streptococci, staphylococci, pneumococci and meningococci, *Bacillus coli*, and the influenza bacillus have been found in the uveal tissue. They generally, however, produce purulent inflammation, but under favourable circumstances a non-purulent inflammation may occur, where organisms are metastatically deposited in the uveal tract, and reach the globe by the blood vessels.

The chronic arthritic troubles which are so frequently associated with iritis are generally *rheumatoid*. Cases of iritis in association with acute rheumatoid arthritis have been published.[1] I have notes of 9 cases where a chronic irido-cyclitis is associated with definite rheumatoid arthritis, most of the patients having Heberden's nodes and the distinctive changes in the compact tissue of the bones due to the rarefying action of the disease, which renders the *x*-ray photographs so clear and distinct. Rheumatoid arthritis is now recognized as being an affection of the periarticular and articular structures of certain joints, due to a chronic poisoning of bacterial origin, which gains access to the blood through some chronic catarrh of the alimentary tract, mouth, nose, pharynx, or air tubes.

Beaumont,[2] writing on this same subject, says:

> I find two men and one woman showed signs of old iritis, that is, in 3.61 per cent. This is a sufficiently high percentage to hint at a connexion between the iritis and rheumatoid arthritis.

In conclusion I would urge that cases of iritis and irido-cyclitis of the prolonged and intractable kind are due to the presence of specific organisms in the uveal tissue; that there is no evidence that toxins alone are capable of producing a localized inflammation of the uvea; that for this reason gout as an etiological factor in producing iritis must be abandoned; that in face of the widespread occurrence of rheumatic fever and the absence of any evidence to show that iritis is generally associated with it, rheumatism as an etiological factor must be given up; the arthritic lesions which are frequently associated with iritis and cyclitis being due to microbic infections, derived from septic absorption; and the causative factor of both the iritis and arthritis is probably the same.

In my opinion all intractable cases of iritis and irido-cyclitis are due to the presence of micro-organisms in the uveal tissue, and the pathological changes produced are the result of their presence there.

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DISCUSSION.

Dr. SNELLEN (Utrecht) said that the nature of irido cyclitis was difficult to understand so long as they were unable to know whether the disease was primary or secondary. In most cases punctate deposits were seen on the posterior surface of the cornea. Fuchs looked upon such deposits as evidence of an affection of the ciliary body. He considered that they were flung there by centrifugal force by the motion of the eyeball, and most modern books gave the same explanation. He (Dr. Snellen) thought that this could not be correct. In a few cases he found that they did not consist only of cells and pigment (proving that they came from the uveal tract), but also of micro-organisms attached to the leucocytes accompanied by uveal pigment. In most cases he could not discover organisms, though they might at one time have been

present. Dr. Rochat of Utrecht had shown experimentally that these punctate deposits could be found without microbes in the anterior chamber if agglutinating toxins were present; if not, the cells fell to the bottom of the anterior chamber and formed a hypopyon. If loosely attached only, they frequently fell or became attached in the familiar triangular form at the lower part of the cornea. To explain the presence of leucocytes, it was necessary to accept the presence of toxins which entered the anterior chamber through the cornea and attracted the leucocytes that were already there as the result of some affection of the uveal tract. He was unable to say if they arose from conjunctival affections or blepharitis, but he could not see how their presence could be otherwise explained.

Mr. GEORGE MACKAY (Edinburgh) said that, owing to the fact that organisms were so seldom to be found in the anterior chamber, he thought it strongly indicated that toxins were capable of setting up irido-cyclitis with the setting free of leucocytes and pigment cells which deposited themselves on the surfaces bounding the anterior chamber, and he regarded the brown colour of the deposit as indicating a subsidence in the inflammatory process. He mentioned two cases, and showed illustrations of one in which there was found a lowered phagocytic index to the *Bacillus coli*. One treated with atropine and helmitol was making good progress, but the other and worse case was doing better with atropine and *Bacillus coli* vaccine. He showed another illustration of a case of prolonged and intractable irido-cyclitis, showing well-marked heterochromia, which had twice given negative reactions to von Pirquet's test, and it was probably due to the *coli* bacillus, though when seen the means of proof were not available.

Mr. T. HARRISON BUTLER (Coventry) firmly believed in oral sepsis as a cause of irido-cyclitis. Yet in Palestine oral sepsis was extremely common and violent, and iritis and cyclitis were almost unknown. Rheumatic iritis, he thought, was probably a myth, and many of such cases as were called rheumatic were due to septic and tuberculous toxaemias. Syphilis accounted for 25 per cent. of all cases. Toxins must be the cause of some, for interstitial keratitis had developed after Calmette's tuberculin had been placed in the eye. A corneal ulcer also could cause a toxic effect upon the ciliary body and a hypopyon would be produced. He doubted, from his experience in Palestine, whether malaria ever produced irido-cyclitis. In a case he had treated of heterochromia it was the dark eye and not the light-coloured one which was affected, and yet the cataract and subsequent glaucoma were typical. There was no proof that constipation was a cause of the disease, though he had seen one associated with mucous colitis.

Mr. CLAUD WORTH (London) said he was convinced that by far the most important cause of irido-cyclitis was septic intoxication, chiefly from the alimentary canal but also from other parts of the body as well. Irido-cyclitis and "quiet cyclitis" were frequently seen in factory girls who suffered from constipation, indigestion, and decayed teeth, and also in middle-aged men who drank much and took but little exercise. He alluded to certain cases of quiet cyclitis which almost exactly simulated cases of chronic glaucoma, and in which there was tension, dilated pupil, slight keratitis punctata, but neither cupping nor enlargement of the blind spot.

Mr. S. H. BROWNING (London) said that iritis and irido-cyclitis might be caused by intestinal toxaemias was to a certain extent proved by the fact that the disease might be cured by bacterial vaccines prepared from the faeces. He had seen a case, with Mr. Lawson, a few months ago of a missionary invalided home on account of irido-cyclitis in the right eye and commencing iritis in the left. Amongst other things, he had examined his faeces and found a non-lactine fermenting organism of the Flexner type. Treatment with a vaccine prepared from this organism cured the eye condition in about six weeks, and the patient had been well ever since. As regards the relationship between cystitis and iritis, he had had several cases of bacterial infection of the bladder in which the eye condition had been cured by a vaccine prepared from the causative organism of the cystitis. As regards the presence of the organism in the anterior chamber, he had only been able to cultivate an organism in one case out of a considerable number of tappings at Moorfields during the last three years, and he was of opinion that most of these cases were due to toxins rather than to the bacteria themselves. He had repeatedly examined the urine of patients suffering from irido-cyclitis for indican, and had been unable to find more than the usual slight trace in practically all cases.

Dr. J. GRAY CLEGG (Manchester) stated that he recently had some 3 cases of extremely chronic irido-cyclitis associated with cataract in young adults; in fact, the only sign or symptom of the irido-cyclitis was the presence of the keratitis punctata. He was of the opinion that in heterochromia iridis the blueness of the iris was secondary to the irido-cyclitis. He had just had a case in which there was distinct subacute irido-cyclitis of oral septic origin which had entirely cleared up, but a portion of the iris was becoming blue.

Mr. W. H. BRAILEY (Brighton) did not agree with Mr. Ormond that a toxin could not cause irido-cyclitis, but thought that this was a very common factor in the complaint, and was possibly the cause of chronic cyclitis and cataract with heterochromia, which in his experience might follow the other symptoms.

Mr. COATS briefly replied.

THE BOARD OF TRADE STANDARD OF EYESIGHT FOR SAILORS.

By KARL GROSSMANN, M.D., F.R.C.S.Edin.,
Honorary Consulting Ophthalmic Surgeon, Liverpool Stanley Hospital.

THE proposed alteration of the standard of eyesight required by the Board of Trade for candidates for certificates of competency has, like every other change, been severely attacked of late. Shipowners, sailors, and even ophthalmic surgeons have rushed into print in the columns of the daily press, and have declared the tests to be far too exacting.

A Departmental Committee on Sight Tests appointed by the Board of Trade in June, 1910, have just issued their report thereon, dated May 12th, 1912, approving of almost all the proposed alterations. Holding no brief for any side, the Board of Trade included, I wish to emphasize some points in reference to this matter.

Before our minds is in grim eloquence the *Titanic* disaster.

The tests, as before, are to comprise (*a*) form vision, (*b*) colour vision, and to be compulsory for candidates for officers' positions only.

A. FORM VISION.

The standard required hitherto has been half normal vision of each eye; from 1914 it will be normal vision of one and half normal vision of the other eye. With much indignation this has been stigmatized as being far too exacting a standard. In a letter by one of my ophthalmic friends to a daily paper of one of the largest British seaports we read:

> Now the Board of Trade are going to the other extreme, and demanding perfection where perfection is not necessary. To see a ship in the distance does not require the acuteness of vision necessary to see certain small letters of the alphabet at 16 ft.

However kind to the sailor the intention of the writer of the above may possibly have been, the passage as it stands is inadmissible, and potentially fraught with great mischief. It puts those whom it apparently wants to help in a wrong position, and is a retrograde step of the most harmful kind, by encouraging inaccuracy as against exactness.

We see its harmful influence clearly in the last paragraph of a letter from the Secretary of the Imperial Merchant Service Guild in the Liverpool dailies of June 30th, 1912, which reads:

> It appears to be a sorry farce to hold that a man is incompetent on a ship's bridge because, forsooth, he cannot distinguish

letters of a certain size at a distance of 16 ft. It is of no use blinking the fact that many shipmasters and officers at the present time, possessed of the keenest vision as regards their duties at sea in picking up objects and lights, could not pass the test.

It is now nearly half a century ago since Herman Snellen in Utrecht introduced accuracy into the determination of the acuity of vision existing in an eye, and his "optotypi ad visum determinandum," thought not absolutely perfect, are sufficiently accurate for practical purposes, and will, above everything else he has done, form the monument by which his memory will live. He brought down the quantitative measurement of vision into arithmetical units, easily determined, easily understood, and easily compared with others.

Whether this is done by means of letters, signs, dots, or any other symbols, is indifferent. Snellen employed the handiest signs, namely, letters, and for general purposes they are still and will remain the best test. What a man is required to recognize is a letter of a certain size at a certain distance, in a certain light, because it is the easiest way for him to give a definite answer to a question which will at one stroke show his amount of form vision, and express it quantitatively in units. If he can differentiate certain objects—in this case letters—under certain conditions, we know from his answer his vision is sufficient for the requirements of the case, and he will also be able to "see a ship in the distance," whatever that may mean.

We come now to probably the most important question—namely, Is "normal" vision for one eye and half normal for the other eye, really much, or even enough, for a man in such a responsible position as that of ship's officer?

It ought scarcely to be necessary to emphasize the fact that Snellen's standard of the unit is a very indulgent one. What we call "normal vision"—$\frac{1}{1}^{2}$ (or $\frac{20}{20}$)—is, after all, only fair average vision. Really good vision, frequently met with in the young, and often kept into old age, is $\frac{30}{20}$, and even more.

But let us be content with the accepted normal vision of $\frac{20}{20}$, and ask, What comprises good vision? During the last thirty years this country has been awakened from one of its many delusions by having to face the fact that almost half of its children require glasses for reading. The wiseacres and those who pander to popular vanity (though it is difficult to see why this should be a matter for vanity) tell you the race is deteriorating. This is the purest nonsense; but the fact that the eyes of the present generation have not deteriorated, but are just as good or bad as those of their elders thirty years ago, would never be admitted.

From my own experience in this country I have learnt that thirty years ago just as large a percentage of children required glasses as now, but—they did not get them. At that time many parents would not hear of their children wearing glasses. It is this attitude on the part of parents that has changed, and not the eyes of the young generation. And inasmuch as the keener struggle for life has ordained that cricket is no longer the chief subject taught in boys' schools, and that more arduous application is required for such eye work as reading, writing, etc., the defect in vision is now revealed for this portion of the curriculum, while it was not discovered before. The result is that we see the schools of this country as full of spectacle wearers as those in any other part of the world.

A very characteristic experience has recently come under my notice in this connexion. When prescribing glasses for school children, the objection was raised: "I cannot wear glasses; grandmother won't allow me to wear glasses"—in every case these children were living with their grandparents, the parents being dead. In grandmother's time glasses were not worn. Parents have by this time been trained to acknowledge the necessity of glasses, and consequently they no longer object.

I therefore ask, What comprises good vision? And the reply is, All those cases in which, whether unaided or with the help of spectacles, vision is at least $\frac{20}{20}$. And these cases mean a large proportion of all the eyes of the country. They not only comprise the slight degrees of myopia and astigmatism, but also the legions of hypermetropics. Who are those who, according to the prevailing popular notions, have good vision? They are mostly hyperopic. Examine them, not in your well-lighted study, but out at sea on a dark night, and note what their vision is then. Unless they are very young, many of them will not be able to pick out a distant dim light, nor "see a ship in the distance" in the dark hours half as well as those wearing properly selected correcting glasses.

What I miss in the new Board of Trade tests is the saving clause that vision, if it can be corrected to normal vision by means of glasses, is to be accepted. At present glasses are not allowed. I hear the chorus of opposing voices: "You would admit a sailor with glasses? Preposterous!" etc. I certainly should. He would be more reliable with corrected vision of $\frac{20}{20}$, let alone of $\frac{30}{20}$ in both eyes, than a man with uncorrected vision of $\frac{20}{70}$ in one and $\frac{1}{20}$ in the other eye.

"Seafaring men could not wear glasses," you say. Why not? For the same absurd reason that engine drivers do not wear them, although many of them require glasses at the present moment; they are afraid of being dismissed as cripples. Yet you make cripples of them by forbidding them to wear glasses. Glasses are as much part of the necessary personal outfit to many as clothes, and quite on a par with them. Would you expect your sailor or officer to work, whatever the weather, without clothes?

And how inconsistent you are. You allow him binoculars, you provide for him when on the bridge those opera glasses called for his special benefit "marine glasses," with the small, restricted field which does not admit of a proper survey, but you forbid ordinary glasses with which he can so readily take in a large portion of the horizon. When will it be recognized that the proper thing is to put the right man in the right place? The man on the look-out must be a man with particularly good sight, and he is not tested at all, neither under the old nor the new regulations for 1914. Why not? The good old slovenly rule of thumb way—"A sailor could not wear glasses," under the tacit understanding that a "sailor" is fit and able to do *everything* well. This sounds very well, but does not work in practice. Does not your "normal sight" sailor, hypermetropic and without glasses, become your most valuable employee when, at the age of 40 to 45 years, his training and judgement have ripened and all his other faculties are in their prime? But his sight, most noticeable in the dark, when his pupils dilate and cease to screen off the circumpolar zone of the lens with its irregular refraction, becomes somewhat troublesome. Not thinking of such a possibility he may not notice it for a time. If and when he becomes aware of this decrease of keenness of vision at night, he dare not take to glasses and thereby put himself right at once! And why superannuate your excellent captain, when at 50 years his eyes, both for short range and at night, refuse to reach full normal vision without glasses! He is, or ought to be, with his training and experience, infinitely more valuable to you than he was twenty-five years before. Does he become a cripple when bespectacled? I should think even with glasses he can give points to the youngsters of 30 years of age. There is, you say, danger for a man so occupied as he, in wearing glasses; an engine driver cannot see sufficiently well with glasses on because they would get cloudy and dirty. Nonsense! Does not the latest kind of engine-driver, the chauffeur, whether amateur or professional, wear glasses, and, moreover, glasses that exclude the peripheral part of the field altogether?

I do not agree with the Departmental Committee's report when they reject the admissibility of glasses. They say (No. 49):

> If it were practicable for navigating officers to use spectacles to improve their distant vision. . . .

I ask, Why is it not practicable?
They answer:

> The evidence which we have heard given by nautical witnesses forces us to the conclusion that with every allowance for exceptional cases the circumstances which attend navigational duties render it quite impracticable to allow officers to depend upon the aid of spectacles for distant vision.

This statement appears to me quite unconvincing. I have already pointed out the superiority of spectacles over binoculars for scanning a large field of vision and for non-luminous objects in poor light. I must confess that my belief in the infallibility of nautical witnesses has been rudely shaken by the experience of the *Titanic* disaster. Such opinions as those that dark icebergs practically do

not occur, mean in reality that they are as good as unknown to the givers of such opinion. It has become a dogma that they do not exist, hence they are not looked for or observed. This may be quite convincing subjectively. Objectively, alas! the *Titanic* catastrophe has proved their existence even to the most dogmatic witness, nautical or otherwise, and doubtless they will be observed, and let us hope avoided, in the future.

Why should glasses be impracticable? Could those nautical witnesses not requiring them themselves ever have tried them properly, or did they ever allow others to wear them? I have personally been able to wear glasses in good working order not only at sea, but also riding in rain and snowstorm for days together, and fording wide rivers on horseback in various expeditions in Iceland, and I found glasses perfectly practicable. And sitting in the crow's nest leaves the hands freer than when managing a horse through deep glacier rivers or over lava fields in a snowstorm.

It is high time that we threw this old and foolish notion on the rubbish heap, and allowed a man to use his faculties freely under the most favourable circumstances.

The Departmental Committee's report further completely omits to mention the possibility of, and desirability of examinations for, diminished vision in the dark. We know that night blindness occurs in varying degrees with apparently normal vision in daylight. To a certain small degree we all have it for the keenest portion of our vision field corresponding to the fovea centralis, as a search for a star of small magnitude will show on any starlight night. Above a certain amount of stimulation we perceive a light or an object; below that limit no perception occurs. That limit may be disproportionately high in the dark for eyes with normal average limit in daylight. What do we know of the light perception in the dark of those on look-out duty on that fateful night of the *Titanic* disaster, both of those who perished and those who survived? There are fearful gaps in our knowledge which cry out for investigation.

In my opinion every sailor should have his sight tested compulsorily and the exact amount of vision should be stated on his papers, not only in the case of officers and those applying for certificates of competency but also in the case of sailors. This would be of great value to the safety of the ship by allotting to each such work only as he is fitted for, with regard to his eyesight, or providing him with suitable assistance in that part of the work where he is deficient, and also in the interest of the sailor himself be much easier for him, in case of an accident to his eyes, to prove any damage resulting to his vision, and would be of great value to him in case of claim for compensation.

Everything would be known and above board, and no concealment of deficiencies would become necessary, with possibilities of serious and disastrous consequences.

Further, every sailor should be examined for vision not only for daylight but also for dark, and his vision noted on his papers.

The *Titanic* collision occurred at night, there was no fog, the stars shone brightly, but the night was very dark, there being no moon (one and a half days before the famous sun eclipse). I do not say that in this case any look-out could have been able to prevent the collision; a speed of 21½ knots in a sea of floating ice on a dark night might defy any vision, even if binoculars had been handy.

I know it is considered almost a sort of disgrace by many a master or officer not to detect a light *before* even the look-out reports it. But there is no need for any such feeling; put your look-out into the crow's nest, and as he is there on a point much higher than the bridge, his horizon is wider and he *ought* to see a distant light *before* those on the bridge. If he does not, he has no business to be in the crow's nest; either his vision or the brain behind it being defective.

Here the *Titanic* inquiry should bear fruit. The President, Lord Mersey, said: "It seems very desirable there should be some test for the look-out men." We must go to the full length and ask for the examination of every sailor.

What needs to be done in future is to put the right man in the right place, in the place for which he is best suited, and to get suitable men only for these places. It is nonsense to say good crews cannot be obtained. They can be had if properly paid. And those lines that pay for good men will live and prosper while the others will have to fall out. Cost is of no consideration here. How much has the *Titanic* disaster cost?

Good vision is desirable for every one, but necessary for at least some individuals on board. *Whether with or without the help of spectacles does not matter*, as long as their vision is sufficient for the purpose. They act as the eyes of the ship. Have I not seen portraits of Admiral Togo wearing glasses? And we have to believe in him; he has given proof of his efficiency.

Not so with the ordinary rules and "laws" of navigation, as reported in some of the evidence of the *Titanic's* second officer with regard to "ordinary navigation which embodies carefulness." I quite agree with him that the binoculars are bad finders of objects, and are mainly of use for examining objects already noticed. But such rule, as going at full speed on a moonless night through a sea reported full of floating ice, happily does not appear to apply to every commander of every ship that crosses the Atlantic. There are masters who stop in an ordinary fog. I remember once coming from Iceland in a small Danish boat of about 1,000 tons. After a good journey we neared Leith, when suddenly the foghorn sounded and the engine stopped; a dense fog had suddenly enveloped the ship, and the boat did not move for twenty-seven hours, until the fog lifted. I was very much annoyed at the time for being delayed so unexpectedly, but with more haste there might ultimately have been less speed. To my mind, at a speed of 21½ knots on a dark night, a collision might just as easily occur or be avoided if no look-out at all had been employed; it would be purely a matter of chance.

I have often heard it said by people who ought to have known better that it is safest to go through a fog at full speed. I have never been able to believe these assertions. It may have become an axiom with some men; but nothing less than this over-awing calamity of the *Titanic* would have sufficed to prove to them and to the world at large that it was not even a "working hypothesis."

The *Times* of August 2nd states that Lord Mersey's report has been received with dissatisfaction in the highest shipping circles in Germany. The commanders of the German transatlantic liners are all agreed that in similar circumstances to those obtaining when the *Titanic* met her fate they would not have reduced speed. In clear weather it is possible to see a great distance ahead, and they maintain that with a proper look-out there would have been ample time to have avoided the collision. The German view, in fact, is that Captain Smith's look-outs failed him. All I can say is, it seems incredible that this should be a correct rendering of the views of the commanders of the German transatlantic liners. Should it turn out to be correct, the travelling public is not likely to share this view, and will quickly transfer its patronage to lines which have taken the *Titanic* lesson more seriously to heart.

Taking into consideration the responsibility of those in command of a ship, actual or potential, I consider that the proposed new Board of Trade standard is not only not too high, but, on the contrary, too low. I disagree in this respect with the Departmental Committee's report, and consider that the standard for any first examination should be $\frac{6}{6}$ for each eye separately.

If at any re-examination at a later period the acuity of vision should become smaller I should consider the case on its individual merits, and should not necessarily disqualify the officer, and the less so the greater his nautical experience and other efficiency. I need not now go into fuller details on this point.

If the Departmental Committee had not been satisfied with the information received from Sir Walter Howell, that the Board were not aware of any casualty which could be traced to defective vision (No. 13), they might have come to the same conclusion as myself and asked for a minimum standard of V. = $\frac{6}{6}$* for each eye separately. Some shipowners—for example, in Liverpool—have adopted and have been using for some time a standard higher than the one now proposed by the Board of Trade.

B. Colour Vision.

With regard to colour vision, the Holmgren test, whether in the original form or in any later modification, including

*I prefer examination at at least 20 ft. to examination at 16 or even at 12 ft. distance.

that recommended by the Departmental Committee's report, is not reliable. It has the one advantage of being cheap, and an examination with it is an interesting experiment; but as the results obtained by it are conclusive neither in the positive nor in the negative direction, it is altogether superfluous. It is neither reliable in congenital nor in acquired colour blindness. It fails completely in central colour scotoma. I pointed out the unreliability of the Holmgren test more than twenty-five years ago, crying as one in the wilderness then; in the meantime the faith in the infallibility of the Holmgren test has been shaken by observations on all sides.

A lantern test showing coloured lights under similar conditions to those seen at sea should be chosen. The lights should vary in brightness, size, and colour. The colours *should not be named*, but matched to a sample. This sample might remain till the matching has been accomplished, or might be allowed to appear for a short lapse of time only, and could then be matched from memory after having been withdrawn. This test to be carried out in the dark. The size of the light should admit of being made so small that even a very small central colour scotoma could be detected. It is twenty-two years ago that I first demonstrated my lantern for quantitative colour tests for this purpose.

The Departmental Committee's report proposes a modification of a lantern for testing colour vision which in my opinion is absolutely insufficient. There is "green," "red," and "white" only represented. Oil or electric carbon filament lamps being used for light, the "white" is a reddish-yellow. This gives practically two colours only—namely, green and red, and leaves too much scope for guessing. No attempt is made to introduce either confusion colours or graduation of the intensity of light. These and other defects make the lamp useless.

With regard to the reservations of the Minority Report of the Departmental Committee, I can, after what I have said above, dismiss them without going into any details.

In conclusion, the safety of the ship, with its officers, men, passengers, and cargo, is of paramount importance, and every precaution ought to be taken to ensure it. Speed and working expenses are of second consideration. I am afraid legislation will not be as effective in this direction as would be a stricter code of conditions by underwriters. With regard to the standard of vision for those in charge of the vessel, the following appears to me the minimum demands:

MINIMUM DEMANDS.

A. *Form Vision.*

1. The proposed new Board of Trade standard is not only not too high, but, on the contrary, too low.
2. It should be $\frac{6}{36}$ for each eye separately.
3. Vision which can be brought up by the help of spectacles to $\frac{6}{36}$ or above, should be admitted.
4. Vision should be tested, not only in the case of ships' officers, but of every sailor, and should be noted on the papers of each man.
5. Vision should be tested not only for daylight, but also for night, and the result noted on the papers of each man, so that the skipper may know whom to place on the look-out and whether in daytime only or also at night.
6. Retesting should take place at certain regular intervals, so as to make known any subsequent changes (defects) to the men themselves and to the owners, such changes not necessarily disqualifying from further service, and especially not if correction be possible by glasses.

B. *Colour Vision.*

7. The Holmgren test is unreliable.
8. A lantern test is required with a suitable lantern.
9. The lantern test suggested in the Departmental Committee's report is quite inadequate.
10. Each eye should be examined separately.
11. Every sailor—officers and men—should be examined and the result noted on his papers, for the reason stated under No. 5.
12. Colour vision should be retested at certain intervals, as there is such a thing as acquired colour deficiency without much deterioration of form vision; the result should be noted on the man's papers (see No. 6).
13. A colour ignorance test is superfluous.
14. All tests for vision should be made by properly qualified men.

It would be as unfair to present certified officers whose vision is found to be defective to have any new regulation made retrospective as it would be a menace to safety at sea not to have new stringent regulations carried out without delay. Arrangements will therefore be indispensable by which all defective officers that have passed the present tests must be either compensated or given such help as to neutralize any deficiency of their visual standard.

DISCUSSION.

Dr. J. W. BARRETT (Melbourne) stated that he knew of four cases in which defective form and colour vision at sea had caused difficulty and accident. The first two accidents were connected with the loss of the P.O. steamer *Australia* outside Port Phillip Head in 1904. The cause of the disaster was the defective form vision of the pilot, whose vision was only $\frac{6}{36}$ in each eye. This pilot had made a mistake a few months before, and had his vision been examined after the first accident, the disaster to the *Australia* would in all probability have been averted. Full details were published in the *Lancet*, October 29th, 1904. The two other cases, involving three officers, had not been published, for obvious reasons. In one case the injury done to the steamer was slight, in the other the accident was averted because another officer recognized what was taking place. The speaker was astonished to find in the appendix to the report of the Special Committee of the Board of Trade the statement made by the one dissentient that accidents due to form vision had not occurred. In consequence of the accident to the *Australia* the Marine Board of Victoria had issued a new set of regulations providing for the complete periodical examination of all the pilots in the service. The standard fixed was much higher than that now proposed to be fixed by the Board of Trade, but the pilot service was, of course, a picked service. The Lighthouse Department had followed, and arranged for a periodical examination, but at a lower standard. The Union Steamship Company of New Zealand insisted on an entrance examination for officers, quite as severe as, or perhaps more severe than, that required for the pilots. It must be obvious to all ophthalmologists that the real desideratum for service at sea was a complete ophthalmic examination when the boy proposed to go to sea, so that the parents would have proper knowledge respecting his future prospects. For ordinary service he did not think the standard should be severe, but the initial examination would prevent much subsequent hardship and injustice. The Union Steamship Company of New Zealand, which now trained its own officers, insisted on this entrance examination. He quite realized the difficulties of the Board of Trade in regard to the supply of seamen and officers, but nevertheless thought that in the interests of public safety the proper course was to arrange (1) a complete examination at the outset, (2) a moderate standard, and (3) periodical examinations throughout the career. In the pilot service of Victoria, if a pilot was absent through illness or accident, or if a ship suffered in any way, he was not allowed to resume work until his vision had been re-examined. He thought that the ophthalmic profession in Great Britain might well approach the Board of Trade and endeavour to arrive at a reasonable understanding which might be found acceptable throughout the empire.

Mr. DEVEREUX MARSHALL (London) said that he totally disagreed with Dr. Grossmann as to the advisability of admitting to the sea services men whose vision could only be depended upon if they were to wear glasses. It would be utterly useless for such men to be employed as look-outs in exposed positions. Even if it were possible to prevent glasses from getting broken and mislaid, fog, mist, and spray would render them useless, though he saw no objection to officers wearing them in the chart-room if necessary, but their distant vision should be normal without their aid, and high cases of hypermetropia should be rejected. He commented upon the recent report of the Departmental Committee of the Board of Trade, and said that it was a most disappointing document. He criticized the action of the committee in recommending a lantern of their own construction, which, on their own showing, had been so simplified that it contained only white, red, and green lights without any modifying glasses at all, and the only modification which could be made was to increase or

diminish the size of the aperture. This very simple lantern they found necessary in order to bring it within the understanding of the clerks and seamen who were the appointed examiners for eyesight of the Board. He considered that if such a lantern were used it was bound to prove that "lanterns" were useless. They still stuck to the Holmgren test against the considered rejection of it by almost every other authority. He was astonished at the official ignorance expressed about accidents which had occurred at sea and elsewhere through men having defective form and colour vision. He felt sure that report would satisfy and convince no one, and it left the matter almost where it was before they started their investigations.

Mr. T. H. BICKERTON (Liverpool) said that he was in entire agreement with Mr. Marshall in his criticism of the Board of Trade report. That document showed an entire ignorance of the condition of the sea service, and he was astonished that it could ever have been presented.

Mr. BISHOP HARMAN (London) severely criticized Dr. Grossmann's recommendation as to the wearing of spectacles by sailors. It was evident, he thought, that Dr. Grossmann had either not worn glasses at sea himself or was unfamiliar with the sea. His own experience of spectacles at sea over many years, under conditions ranging from fishing smacks to the bridges of large liners, was that spectacles were worse than useless; they speedily became covered with spindrift and fine drops of rain, so that the vision of anyone wearing them would indeed be bad if he could see better with them than without them. Spectacles were a boon in their proper place, but at sea they were an impossibility.

Mr. HARRISON BUTLER (Coventry) also agreed that spectacles at sea were useless, and that he considered vision of $\frac{6}{6}$ to be absolutely necessary for men employed as look-outs.

Dr. GROSSMANN replied.

DISCUSSION ON THE USE OF TUBERCULIN IN DISEASES OF THE EYE.

OPENING PAPERS.

I.—GEORGE MACKAY, M.D., F.R.C.S.E.

(With Coloured Plates.)

MR. PRESIDENT AND GENTLEMEN,—I have, in the first place, to acknowledge the compliment of being asked to open a discussion in the Section of Ophthalmology, and to thank the Committee for accepting the suggestion that an interchange of opinion upon the use of tuberculin in relation to diseases of the eye might be instructive and helpful to members of this Section.

Robert Koch's epoch-making discovery in 1882 that the tubercle bacillus is the cause of tuberculosis in its multifarious aspects, and his announcement in 1890 of tuberculin as a curative remedy, has led to experimental, clinical, bacteriological, and pathological researches so vast and abundant that I must refrain from attempting to survey the recorded literature of the subject even in the realm of ophthalmology, and assume that this audience will only expect me in the brief time at my disposal to indicate the lines upon which our discussion may conveniently and expeditiously proceed, so as to afford each of us an opportunity of stating his personal experience.

Dr. Peel Ritchie and I suggest that the discussion upon the use of tuberculin in diseases of the eye should be conducted in accordance with the scheme which has been placed in your hands:

I.—The use of tuberculin in the diagnosis of ocular tuberculosis.
  1. Which preparation and which method of application is the most reliable?
  2. The importance of differential diagnosis between the human, bovine, and avian varieties, and the means of discrimination.

II.—The use of tuberculin in ocular therapy.
  1. General principles.
  2. The choice of preparation.
  3. The scheme of dosage.
  4. The duration of its influence.

III.—Illustrative cases and statements of experience in the use of tuberculin in diagnosis and treatment.

I.—THE USE OF TUBERCULIN IN THE DIAGNOSIS OF OCULAR TUBERCULOSIS.

For the diagnosis of tuberculosis Koch's old tuberculin may be employed in at least four different ways.

1. *The Subcutaneous Method.*—An initial dose (usually 0.0001 c.cm. of the original fluid) is given by hypodermic injection. The diagnosis is founded on the evidence of resulting reactions, general and febrile, local and specific. The general reaction requires careful observation of the patient's temperature before and after the injection, and is better suited for sanatorium and hospital rather than for ambulant treatment. The local reaction in the eye is not free from danger, since increased exudation may impair the ultimate efficiency of the organ. A cicatrix which in the lung is proclaimed a cure may become a lifelong disaster in the eye. The production of a lowered or "negative phase" in the phagocytic index taken about twenty-four hours after the injection, and followed by a "positive phase" with raised index for a variable period thereafter, has been largely used as a guide or confirmation of the diagnosis. This may follow an inoculation with any of the tuberculins. In ophthalmic practice the test may be employed more freely as an aid to diagnosis of suspected tubercle in parts adjacent to the eye, but not involving the eyeball itself. In any case large initial doses and excessive local reaction must be avoided.

2. *Calmette's Ophthalmic Reaction.*—For this, one or two drops of a glycerine-free preparation of Koch's old tuberculin are applied to the conjunctival sac. The diagnosis rests on the appearance of a conjunctivitis in tuberculous persons in from twelve to twenty-four hours. It indicates that tubercle is present *somewhere*, but not necessarily in the eye. It is not free from danger. The occurrence of disastrous local reactions has led to its condemnation where there is any pathological condition present in the eye (especially superficial lesions), and this, of course, greatly restricts its employment in ophthalmic practice. The danger is lessened by using a diluted drop.

3. *Von Pirquet's cuti-reaction* aims at the production of a local reaction in some thin-skinned part (for example, the forearm) by simple vaccination with a drop or two of Koch's old tuberculin smeared into a small area which has been carefully cleansed and slightly scarified. The previous scarification of another small area, well isolated but adjacent to the first, and to which only a little saline solution is applied, acts as a control for comparative observation. In this test the tuberculin is usually applied in 25 per cent. dilution; but if this prove negative it may be used in full strength before accepting the verdict. A positive reaction by this method may be taken as evidence of tuberculosis present (or perhaps past) *somewhere in the system*, but it is not a certain indication that the malady in the eye is altogether or even partly tuberculous; it may be only coexistent. The test has the great merit of safety and simplicity, and though it does not reveal the whole truth, it tells enough to justify a trial of tuberculin in the treatment of many doubtful cases.

4. *Moro's tuberculin ointment test* is only a modification of von Pirquet's—of some possible service in timid persons who dread scarification, but is not so reliable. And there are various other modifications to which it is not necessary to refer.

Koch's old tuberculin may be prepared from tubercle bacilli of human or bovine origin, and contains not only the products of the bacilli, but also the nutrient medium. It is a concentrated boiled culture freed from bacteria by filtration. For diagnostic purposes either the human or the bovine strain appears to be capable of exciting the cuti-reaction, and it is doubtful whether any special advantage is gained by employing one rather than the other, so far as a specific diagnosis can be secured thereby, since apparently a patient affected with tubercle from either source will respond to both varieties. But definite

Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

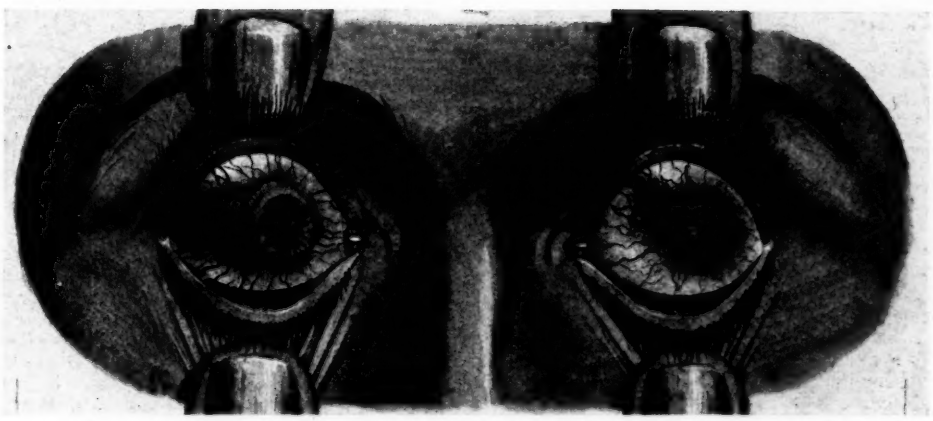

Fig. 5.

Fig. 6.

FIG. 7.

FIG. 8.

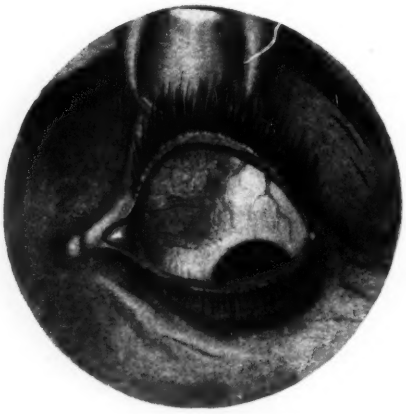

FIG. 9.

FIG. 10.

FIG. 11 A.

FIG. 11 B.

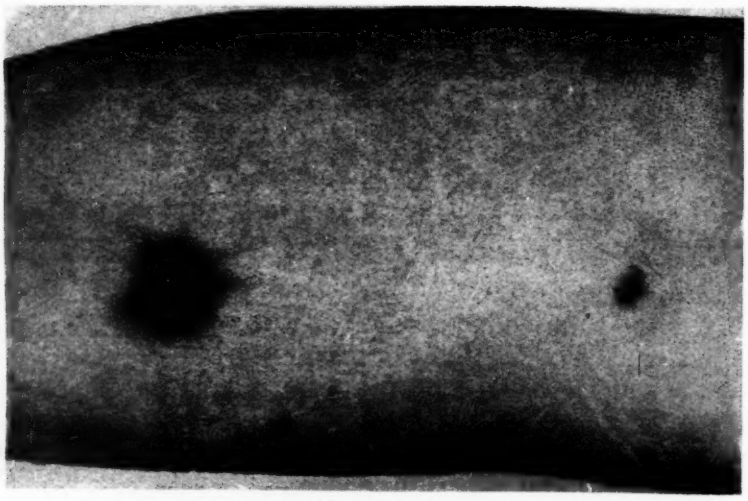

FIG. 11 C.

observations on that point will be welcome to-day. There is good reason to believe that the discrimination is of importance in treatment. As regards infection by bacilli of avian type, the records are so scanty that little can be said, and the occasions for recognition of that variety in ophthalmic practice must indeed be avian rarities.

When I first began to study vaccine treatment the methods of Calmette and von Pirquet had not yet been introduced. Sir Almroth Wright's investigations into phagocytic indices appeared to offer the best available method of determining the presence of organismal infections and elucidating their nature. I gladly availed myself of the skilled assistance of Drs. Ian Stewart and Peel Ritchie of Edinburgh, who had already gained a large experience of Wright's methods. I am greatly indebted to both these gentlemen for their labours and interest. Dr. Ritchie, in the midst of many other claims upon his time as a general surgeon, has attended frequently at the eye wards of the Royal Infirmary and undertaken a long series of phagocytic observations upon which our clinical notes are largely founded, and I gratefully acknowledge his assistance. He is present to-day, and will tell us the plan which he has followed in this investigation.

I am well aware that considerable scepticism has been expressed as to the reliability of the phagocytic indices. The risk of mathematical inaccuracies, the personal equation of the observer, and the laborious character of the inquiry have tended to discredit it. But in the earlier stages of investigation it has been helpful, and in the hands of an expert I cannot but regard it still as an aid to diagnosis of very considerable value. It has undoubtedly helped us to gain experience as to the class of cases in which tuberculin treatment might be justifiably recommended; it has indicated the presence of mixed infections, and we believe that it has enabled us to exclude tuberculosis as a causative factor in some doubtful cases. For routine purposes, where the presence of tuberculosis alone is to be certified, we now employ von Pirquet's cuti-reaction. Where the diagnosis presents special difficulty the phagocytic indices are investigated prior to the application of von Pirquet's test, or some little time afterwards, if the cuti-reaction has been negative.

II.—Tuberculin in Treatment.

Turning now to the use of tuberculin in treatment, one can employ (1) Koch's old tuberculin, (2) Koch's new tuberculin (T.R.), and (3) Koch's emulsion of tubercle bacilli (B.E.). Each variety can be obtained prepared from either human or bovine tubercle bacilli. There are other modifications to which I do not now refer because I have no personal experience of their use or advantages. Old tuberculin is now but little employed for purposes of treatment, and is least well suited for ophthalmic cases. The new tuberculins (T.R. and B.E.) consist of the bodies of the bacilli ground down and dissolved or suspended in a watery solution, and when injected in appropriate doses promote an antibacterial immunity. The view has been advanced that the human and bovine forms of tuberculin are antagonistic to one another; that in the case of human infection the bovine vaccine should be used, and vice versa; but this does not accord with our experience. It is claimed that a proper interval between the doses is best secured by a careful study of the opsonic index, so as to avoid repeating the dose until the "negative phase" is past and the "positive phase" well established. But sufficient experience appears now to have been obtained to justify the view that if the initial doses of vaccine are small, the increase gradually made, and the inoculations not too frequent, the clinical condition of the patient and the absence of local reaction may be taken as a guide without continued repetition of the tedious observation of the opsonic index. The safest preparation appears to be Koch's new tuberculin (T.R.)—human or bovine—which produces the least violent reaction. Where a more powerful effect is desired the bacillary emulsion may be employed.

The two chief methods of administration employed in ophthalmology have been: (1) Wright's, in which, commencing with a small fraction, $\frac{1}{50000}$ mg. to $\frac{1}{10000}$ mg., the dose is gradually increased over a prolonged period of treatment at about ten days' interval between each inoculation, and the dosage is regulated by the phagocytic index. (2) Von Hippel's method of treatment, commencing with an initial dose of $\frac{1}{500}$ mg. of tuberculin T.R., the inoculation is repeated on alternate days, and increased each time by $\frac{1}{500}$ mg. until a dose of $\frac{1}{50}$ mg. up to $\frac{1}{5}$ mg., then by $\frac{1}{10}$ mg. until 1 mg. is reached. If during the treatment the temperature rises above 100° F., the previous dose or a smaller one is repeated, until there is no rise of temperature after the inoculation.

No hard and fast rule can be laid down for the scheme of dosage. The personal reaction of each patient must be studied, and the observer must be prepared to lessen or may feel justified in increasing the dose by simply watching its effect. It must be borne in mind that the treatment does not consist in flooding the patient with a massive dose of bactericidal material ready prepared, but in stimulating his own tissues to produce the opsonic material necessary for his protection, and many factors in his condition may modify his capacity in that respect.

III.—Illustrative Cases and Experience.

Phlyctenular Conjunctivitis.

No part of the eye is free from the ravages or indirect effects of the tubercle bacillus. In several of its manifestations the clinical picture is so definite that a diagnosis of its presence may confidently be made by the clinician either from the actual appearance of the eye or the associated evidence of tuberculous disease in other parts of the body. But there are not a few cases in which some aid to diagnosis is required either because the appearances do not follow the well-recognized clinical types, or are not easily differentiated from those produced by other toxic processes, or where a mixed infection makes it difficult to determine the various factors in the disturbance.

As regards one of the commonest ocular diseases, phlyctenular conjunctivitis, while we recognize its frequent association with definite tuberculous infection of glands, or bones, or skin, or viscera, we still have, or at least I think the majority of us have, some diffidence in pronouncing a phlyctenule as a manifestation of pure tuberculosis, or of yet saying exactly to what its origin is due. We feel no hesitation in pronouncing a patient a tuberculous subject who, along with a phlyctenule of the conjunctiva, exhibits also lupus of the nose or glandular cicatrices in the neck. But we have more hesitation in relegating to the same category Kate A. (Fig. 1), who showed no other manifestation of known tuberculous disease, and whose phlyctenule disappeared under a few days' treatment with calomel dusting, or weak yellow oxide of mercury ointment; or Jean M. (Fig. 2), who only took a little longer to recover with the addition of atropine because her corneae were involved. There was little difficulty in recognizing that the large, granulomatous, pulpy mass which occupied the ciliary region in the upper nasal quadrant of Mrs. T.'s (Fig. 3) eye was of tuberculous origin, when one learnt that she had been suffering for years from extensive tuberculous disease involving the right shoulder and clavicle, that she had a sinus in her axilla and foci in the forearm. But had a cuti-reaction with tuberculin been available, it might have fortified the diagnosis of tuberculous deposit in the deep punctate keratitis and massive exudation in Ethel C.'s (Fig. 4) anterior chamber. This little girl, 13 years old, seen in January, 1906, was examined by Dr. G. A. Gibson, and reported free from signs of tubercle elsewhere, and an absolute diagnosis was not made until after enucleation, yet this child died of acute tuberculous meningitis within a few weeks of the enucleation.

Early in 1907 a young lady, Miss W., who had been under my care occasionally for some years, suffering from phlyctenular conjunctivitis and keratitis, developed a more than usually obstinate attack with corneal infiltration and large pustules breaking down into deep ulcers on the sclera. I invoked the aid of Dr. Ian Struthers Stewart, in the hope of determining from her phagocytic indices the cause of her malady. As that case was communicated to the Ophthalmological Society of the United Kingdom, and published in its *Transactions* (see vol. xxviii, 1908), I need not enter into any detail beyond saying that the method of opsonic inquiry served our purpose well enough to reveal that one had to do with a staphylococcic rather than a tuberculous infection, and under staphylococcic vaccine treatment this patient made a good recovery, and has continued well since.

In an interesting research reported in the *Lancet* (December 1st, 1906) Nias and Paton found so close a correspondence between the rise and fall of the opsonic index for tubercle, *pari passu* with the development and

retrogression respectively of phlyctenules or phlyctenular ulcers in children, that they concluded that these efflorescences are of tuberculous origin. They considered that their research supported the "hypothesis of Lebe and others that these (phlyctenular) ulcers are due to attenuated or dead bacilli escaped from some unidentified focus of tuberculous disease, either free or taken up by leucocytes and not having sufficient vitality to generate a typical tuberculous lesion at their new site."[1] The occurrence of staphylococci in such cases as a secondary infection is generally admitted. But it seems difficult to exclude the possible occurrence of such widely distributed organisms as staphylococci as a primary factor also in these cases, and it does not appear that Nias and Paton excluded them by their method of inquiry. The prompt disappearance of phlyctenules in many cases under simple local treatment makes it hard to believe on clinical grounds that they are always primarily tuberculous. I cannot myself go further than the belief that they are manifestations of local staphylococcic infection in a soil well suited for tuberculous cultivation, often, indeed, already planted and flourishing elsewhere in the system. I do not regard them as a hall-mark of tuberculosis. I would rather say that in the human mansion they constitute a sign of "Apartments to let for tubercle." I frankly admit that other tuberculous tenants are frequently already in occupation of neighbouring quarters, but I do not think they are necessarily the first arrivals in that upper story which we call the conjunctival floor.

I should like next to refer to a closely allied group of cases occurring more frequently in adults, cases more of the nature of episcleritis, sometimes with and sometimes without a definite efflorescence rather deeper seated than the ordinary phlyctenule, rarely ulcerating unless upon the cornea, sometimes occurring without keratitis, often recurring with keratitis. As a junior surgeon I occasionally saw such cases of patchy episcleritis diagnosed and treated as rheumatic, and observing that in some at least one could elicit no history of rheumatism, and that in a certain proportion there were obvious glandular scars in the neck, I became impressed with the idea that many of them were not rheumatic, but were more related to the strumous diathesis. That opinion became more confirmed when, with increasing experience, one recognized that the same individual seen at different times might on one occasion exhibit an episcleritis, at another a phlyctenule, or a corneal infiltration, or an actual ulcer, or some combination of these, as in the case of Mrs. J. (Fig. 5).

When Dr. Peel Ritchie first came to work in my department, and at my request investigated this class of case particularly, he cast his net widely and sought for phagocytic evidence of the presence of staphylococci, pneumococci, streptococci, *Micrococci rheumatici*, as well as tubercle bacilli. It soon became evident that the staphylococcic index was the most frequently perturbed, and the wide diffusion of that type of organism, and the facility with which its products may find their way into the blood stream apart from an ocular source of infection, made it as difficult to be confident that it was the causal factor as to exclude it as one of the possible factors in a mixed infection. Anyhow, in several cases of episcleritis and phlyctenular conjunctivitis and keratitis we were guided by the phagocytic indices to attach importance to the staphylococcic infection, and staphylococcic vaccine treatment gave apparently good results.

As bearing on that point I would present the case of Mr. R. (Fig. 6), aged 30, a cashier and book-keeper. He had been complaining for three weeks of a pain in his eyes affecting the upper aspect of each globe. In the right there was a broad patch of episcleral injection without any definite nodule of infiltration. In the left, along with a smaller broad patch of injection, there was an ill-defined rather buffy subconjunctival phlyctenule a little above the vertical meridian of the cornea. The corneae and irides were not involved. The phagocytic indices were taken for *Staphylococcus aureus*, *Micrococcus rheumaticus*, *Streptococcus pyogenes*, but bovine tubercle was not, and, indeed, could not, at that time be specially investigated. *Staphylococcus aureus* having given here the most marked variation in the comparative indices, it was taken as the indication for treatment by injections of staphylococcic vaccine, and it seemed all the more probable since Mr. R. had recently had a gumboil. He was given six staphylococcic injections during the next three months (April 7th to June 25th, 1908). Improvement set in rapidly. The right eye, which had no efflorescence, lost its injection first, and by June 25th both eyes were apparently free from inflammation. On October 6th of the same year, just after a holiday, he returned with a fresh attack affecting the left eye on the inner upper quadrant. There was an ill-defined nodule, with bright red injection of the conjunctiva over and around it. No yellow focus. Pain considerable. Tongue furred. He received staphylococcic injections as well as Gregory's powder, and in a week returned much improved—pain gone, nodule flatter, injection less—and after three further injections he was practically well. On February 27th, 1909, he returned with episcleral nodule on left eye below limbus corneae of ten days' duration, showing a yellow centre and injection around. No pain. Staphylococcic injections were resumed, and after four more he recovered and has remained well up to date of last inquiry—May 11th, 1912.

Similarly Mrs. J. (Fig. 5), aged 43, who came under my care about the same time, had had three attacks of inflammation in the eyes—the first in 1901, the second in 1907, and the third which brought her to me in 1908. The last had commenced ten weeks previously, and occurred at the same time as a pimply eruption on the face. She had considerable pain and headache. There were some peripheral opacities on the right cornea, left apparently by the previous inflammation. During the present attack the right cornea was fairly free from injection, but there was a well-marked episcleral patch with an efflorescence over the posterior ciliary zone at the outer side of the right eye. There was less extensive injection of the left eye, but a corneal infiltration with a denser central focus occupied the upper nasal quadrant, and extended to the centre of the pupil. In both eyes there was some evidence of dusky thinning of the sclera from previous attacks. Her index for *human tubercle*, taken by Dr. Peel Ritchie, was practically *normal (1.06)*, but a lower index for staphylococcus (0.78 on one occasion and 0.79 taken at a week's interval), and a "*negative phase*" *following the first therapeutic injection* of staphylococcic vaccine appeared to give the indication for treatment, and she received thereafter eight inoculations of staphylococcic vaccine. The conclusion in this case was not very emphatic, for her attendance was irregular and her improvement slow. She made eventually a fair recovery, but with considerable corneal opacities, and has remained well to the present date.

In these two cases the index to bovine tubercle was not investigated, for want of suitable facilities at that time.

In 1909 the following cases, showing more involvement of the corneae, in which an early recognition of a *mixed infection* based on phagocytic indices was followed by treatment with the double vaccine, gave gratifying results:

Thomas D. (Fig. 7), aged 35, a pithead fireman from Lanarkshire, over 6 ft. in height and strongly built, came under observation on June 12th, 1909. Both eyes had been inflamed in boyhood. He had then kept free from inflammation until a month before his visit, when it recurred after influenza. The tuberculous tendency in this man was easily recognized, because he had had enlarged glands in his neck since boyhood, some of which had spontaneously suppurated and burst, but had never been operated on. The scars remained. The glands were not prominent, but one could be felt. Three sisters had all had trouble with cervical glands. He considered his general health good. His right eye showed diffuse injection of the sclera, especially about the ciliary region, with a phlyctenule-like efflorescence at the lower corneal margin about 5 o'clock, and scattered nebulae in the cornea. His left eye also showed corneal and scleral scarring. His phagocytic indices were as follows:

T. avium = 0.88	*T. hominum* = 0.86
T. bovum = 0.69	*Staph. aureus* = 1.11

Atropine drops were prescribed, and he was given combined injections of bovine tuberculin and *Staphylococcus aureus* ranging from 0.0005 mg. of each to 0.004 mg. of each. The treatment extended from June 18th to February 26th, 1910. He made comparatively rapid progress, and at each returning visit declared his health better. By February the injection had all but passed away, and in April he was admitted to my ward for iridectomy, which was performed first upon the left eye and a week later upon the right. Soon after going home he developed a phlyctenule of the left eye, and injections were repeated and continued until October 8th, 1910, when he reported himself as keeping well in every way. On July 13th, 1912, he came with obvious pleasure to report himself very fit and always at work during the past two years.

R.V. $\bar{c}$ —1 D. sph. = $\frac{6}{12}$; L.V. $\bar{c}$ —1 D. sph. = $\frac{6}{6}$.

In the fundus of each eye, but chiefly the left, there can now be seen disseminate choroidal pigmented spots.

The next case, that of William McG. (Fig. 8), aged 11, seen first on June 5th, 1909, is of some interest because along with multiple episcleral nodules and corneal infiltrations very similar in character to the last patient, there was *no history of glandular enlargement* nor family history pointing to tuberculous tendency, unless it were that a brother had died a year before of inflammation of the brain of short duration. The patient had had some inflammation in his eye four years previously. The present attack had ensued four weeks before his visit. He had some carious teeth, but no suppuration. His left eye (as shown in the illustration) exhibited multiple episcleral nodules with corneal opacities chiefly of the lower inner quadrant. Atropine and boric lotion were ordered, and he returned home until a

report could be obtained on his phagocytic indices, which were found to be as follows:

T. avium = 1.0	*T. hominum* = 1.0
T. bovum = 0.61	*Staph. aureus* = 0.89

He was not seen again until July 24th, when it was found that the inflammation was extending and he was admitted to the ward. The indices taken again showed a raised index for staphylococcus, but a still subnormal index for bovine tubercle. On July 28th treatment was commenced with the combined vaccines *T. bovum* and *S. aureus*. There was no local reaction from the doses employed. These were repeated at intervals of two to four weeks. By October 16th injection was almost gone, by November 13th entirely gone, and by December 11th the eye was practically well and the nodules resolved. He had altogether seven injections, spread over six months. So far as known he has continued well.

Further illustrations could easily be given, but with these happy experiences of the benefit of the mixed vaccine treatment I have had no hesitation since in employing and recommending it in apparently similar cases, with most gratifying results.

I should like to conclude this section by exhibiting one of my most completely investigated recent cases, which appears to show a pure tuberculous infection of the human type.

*Mrs. W. (Fig. 9), aged 41, who only came under observation on July 15th of this year, had never been troubled with her eyes until seven weeks ago, when her left eye became tender and reddened at the nasal side. There was no secretion, nor did the lids gum, nor was sight affected. Externally there was little to be seen at fault until the left upper lid was raised, and then a broad patch of episcleral thickening was revealed in the upper inner quadrant, a diffuse elevation with *no appearance of yellowness, nor suppuration*, nor any definite phlyctenular-like efflorescence. Slightly tender to touch. Her general aspect a little anaemic. She had lost all her teeth save two, right premolars, one above, the other below. These were decaying, and might have been a source of infection. She exhibited no scars in the neck, nor could glandular enlargements be felt, and had no idea as to the causation of the eye trouble. Before any further history was elicited Dr. Ian Stewart was good enough to examine the blood, and gave me the following note of the indices:

Staphylococcus	1.01
Bovine tuberculosis	1.10
Human tuberculosis	0.72

On the following day von Pirquet's test was applied with Koch's old tuberculin of human strain, which gave a moderate positive cuti-reaction on the right upper arm. On July 20th some blood was taken for the examination of the phagocytic indices, and immediately thereafter she was given an injection of $\frac{1}{1000}$ mg. of tuberculin bacillary emulsion of human strain. After twenty-four hours the index, taken again, showed *a marked negative phase to human tubercle*. Confirmation of a tuberculous causation thus appeared ample. The question arose, Where was the tubercle seated? It now appeared, on closer scrutiny of her history, that she had had one sister phthisical; seven children alive and well, three said to have died of pneumonia; that as a girl she had some enlarged glands in her neck, which disappeared after painting with iodine, but she was unconscious of anything being now at fault. An examination of the lungs revealed slight dullness, with increased vocal fremitus and resonance and prolongation of expiration at left apex behind. No accompaniments. It was further discovered that a year previously she had been in hospital and had an operation in Professor Alexis Thomson's ward by Mr. George Chiene for the removal of a gland in the right axilla. This was found to be tuberculous, and her tuberculous tendency was further proved by von Pirquet's test applied at that time.

This case appears to be proved up to the hilt, and it will be interesting to see how she responds to a course of treatment by human tuberculin. It also illustrates the difficulty in getting at the history of some of our eye patients.

But tuberculous infection assumes many forms.

When I first saw Mr. E. (Fig. 10), aged 41, a bookseller and publisher, on August 13th, 1909, with a rather persistent inflammation of his right eye, his physician, Dr. R. Thin, had not been able to discover any reasonable explanation for it, and the appearance of the eye gave little indication of any definite etiology. As shown in the illustration, the eye presented a moderate ciliary injection, with only slight photophobia. He had never had any previous trouble, and considered that he enjoyed good health. There was just a trace of greyness in the limbus corneae below, no further corneal opacity nor ulceration, no punctate keratitis. The pupil reacted, though a little less actively than in the sound eye; it dilated fairly, but not widely, under atropine, remained circular, and showed no synechiae, and the ciliary injection remained thereafter little altered. Dr. Thin assured me that he had never exhibited any signs of tubercle, and beyond the fact that his mother had died of consumption when he was a year old, the family were not supposed to be tuberculous. I had some difficulty in persuading his doctor and his brother (a London physician) that anything could be gained by investigating Mr. E.'s indices for tubercle. But eventually, consent having been given, Dr. Ritchie made the necessary examination, with the following result:

T. avium = 0.85	*T. hominum* = 1.43
T. bovum = 0.85	*Staph. aureus* = 0.85

The divergent and supernormal index for human tubercle strongly indicated infection therefrom, and with this as a justification for treatment Mr. E. received six injections of human tuberculin T.R. From August 23rd to December 15th the redness slowly faded away, and by the end of four months he was practically well, doing a full day's business, and able to withstand the strain of Christmas trade. He has kept perfectly well since.

I have had gratifying experiences in the use of tuberculin in cases of irido-cyclitis with punctate keratitis. I believe that I have in some instances been enabled to prevent employers being imposed upon in cases where compensation was claimed for inflammation of the eye supposed to be due to minor injuries, through being able to prove (at least, to my own satisfaction) that the case was not so much due to traumatism as to constitutional poisoning with tubercle.

I should like to draw special attention to the value of tuberculin as a means of diagnosis in some cases of interstitial keratitis of doubtful etiology. As is well known, a large proportion (according to Hutchinson, fully 75 per cent.) of cases of interstitial keratitis are due to inherited specific disease. But in a certain number little confirmation can be got from either the facies of the patient, the dentition, or other characteristic signs of that inheritance. On clinical grounds it has been generally admitted that some proportion of cases are related to tubercle, but the proof has not been hitherto well established. Greater certitude may be attained, or at least sought for, by the employment of the Wassermann reaction for the one and the tuberculin reaction for the other.

Maggie W. (Fig. 11), aged 12, was sent to my ward by Dr. Rae, of Wick. She had been suffering for several weeks from severe interstitial keratitis, with great photophobia and considerable steaminess and infiltration of the corneae, without any ulceration. There was nothing abnormal in the formation of her skull or bridge of the nose, but her teeth were as illustrated, with rather poor and pitted enamel, and slight notching of the upper incisors, and each canine peg-shaped and decaying. She was treated for a time as an out-patient in the usual way, with atropine and small doses of mercury and iron. But as she was making but little progress I admitted her to my ward and applied a von Pirquet's cuti-reaction, with very marked positive result. She had not been complaining in any way of glandular swellings, but on careful search one enlarged gland could be felt below and behind the angle of the jaw on the right side, and there was a history of her having had at one time swellings on the left side of the neck, but no cicatrices to attract attention. Wassermann's reaction, applied for me by Dr. Carnegie Dickson, has revealed a "definite syphilitic reaction," so that here is an undoubted instance of the possibility of a mixed infection. She is now under *Perbucht* tuberculin as additional treatment, and making good progress.

(Illustrations were given of other two cases of interstitial keratitis—one in a girl aged 12, the other in a domestic servant aged 21—in which Wassermann's reaction was *negative* and von Pirquet's *positive*.)

I recommend the use of tuberculin in the treatment of cases of interstitial keratitis which respond to von Pirquet's test.

Passing over cases of disseminate choroiditis with a tuberculous origin, I should like to mention that I have at present under my care a small boy, Andrew C., aged 6, with a large buffy mass in his left vitreous, raising a doubt as to the diagnosis of glioma or pseudo-glioma. The anterior chamber is shallow. There is no retraction of the periphery of the iris, and when recently exhibited to some of my ophthalmic colleagues at a meeting of the Scottish Ophthalmological Club, considerable doubt was expressed as to whether I was justified in describing the case as pseudo-gliomatous. In the meantime, however, von Pirquet's reaction has proved positive. Dr. Leslie Lyall, assistant physician to the Victoria Dispensary for Consumption, tells me that there is some evidence of phthisis at the apices of the boy's lungs, and though one cannot hope to restore vision, I feel that tuberculin has enabled me to refrain from enucleating what is at present a quiet and not unsightly eye, and offers a means of remedy at least worth trying.

*It may interest the reader to compare this case with one published by Mr. J. B. Lawford, F.R.C.S. (See the *Transactions of the Ophthalmological Society*, vol. xxx, p. 134 and Plate 6.)

Let me add an observation upon the value of tuberculin in *muscular palsies.*

Lizzie T., aged 19, of rather small physique, but with no obvious signs of tubercle or complaint of ill health, suddenly developed a paralysis of the left external rectus. In the absence of any obvious cause, the usual surmise of a rheumatic origin led to treatment by blistering the temple and the internal administration of sodium salicylate. As after a month's perseverance in this course no improvement appeared to have been secured, a cuti-reaction was applied. The response was markedly positive. *Perlsucht* tuberculin injections were commenced; after the second or third dose improvement rapidly followed, and in a few weeks recovery was complete. It was the remark of her friends, and her appearance also bore it out, that her general health had extraordinarily improved at the same time. As she resided in the country I was unable to arrange for her indices being taken prior to treatment.

A few weeks ago Mr. R., aged 35, a clerk, came to consult me, complaining of diplopia. The photograph (Fig. 12) shows that he was suffering from a paralysis of his right external rectus. He had sought advice at a public institution, and his right temple shows the mark of the blisters which had been applied. Antirheumatic remedies had also been given. He denied any specific infection, and considered his general health good. But on inquiry I learnt that the paralysis had ensued after sitting in a rather draughty tent watching some entertainment at the seaside, and that two or three days previously a gland in his neck had been incised by his own physician. The photograph exhibits the still scarcely healed wound a little above the clavicle at the root of the neck on the right side, and a chain of three or four enlarged glands could be felt leading up to another cicatrix half way up to the ear at the posterior border of the sterno-mastoid. In this case a cuti-reaction seemed superfluous, and treatment by *Perlsucht* tuberculin was at once initiated. He has had two injections and feels better. His primary deviation has lessened and his range of external movement has increased.

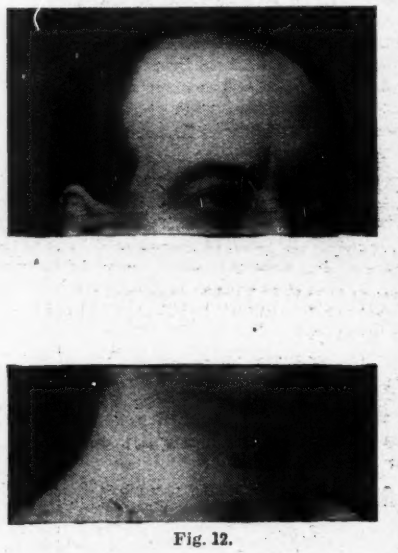

Fig. 12.

A case almost identical with this was that of a young woman lately sent to me by Dr. Hamilton, of Hawick, with paralysis of the right external rectus of recent origin. She had suffered for a long time from a tuberculous ankle, and had her foot amputated a year ago. I had no hesitation in advising the use of tuberculin, and have only this morning heard that she has now had four injections of $\frac{1}{1000}$ mg. of new tuberculin T.R. (bovine) from Dr. Oliver Hamilton, who reports, "Her diplopia is gradually improving, especially since the third dose. Her giddiness has disappeared, and she seems happier in herself now."

In these three cases the acuteness of vision was undisturbed and the fundi normal.*

Negative Cases.

Thus far I have only endeavoured to illustrate cases in which tuberculin has been of value as positive evidence of the presence of tuberculosis. I could easily adduce others in which it has been proved of value as a negative means of diagnosis, more especially cases of irido-cyclitis whose etiology is often obsure.

CONCLUSION.

I would submit that in tuberculin we have a valuable remedy, if judiciously employed, to assist us both in diagnosis and treatment. I am not unmindful that in the study of disease we are constantly confronted with the danger of forgetting that *post hoc* is not necessarily *propter hoc.* If we may trust to a cuti-reaction as a sure indication of tubercle somewhere in the system, we still have need to determine to what extent it is the exciting factor in any particular case of ophthalmic disease. In treatment also we have much to learn as to whether we cannot accelerate the process of cure. We must never forget that the *vis medicatrix naturae* is, after all, the great healer. We need not lay the flattering unction to our souls that the recovery of our patients depends solely upon the treatment which we have employed. The most experienced practitioners will be the first to admit that their patients frequently cure themselves by processes beyond our ken, sometimes despite our well-intentioned but misdirected efforts. We may admit that humbly and thankfully *sans peur et sans reproche*, if at least we have striven to do our best. In the diagnostic and therapeutic considerations to which our thoughts are turned to-day we may advance with some assurance that we are acting on the principle of assisting the human frame to utilize its inherent powers to combat a most insidious and destructive malady.

*All three cases have now made excellent recoveries, lost their diplopia, and improved in general health.

REFERENCE.

1 *Lancet*, 1906, vol. ii, p. 1500.

II.—L. C. PEEL RITCHIE, Ch.M., M.D., F.R.C.S.Edin.,

Research Student, University of Edinburgh.

THE object of my investigation was to apply to certain forms of eye disease of uncertain etiology those methods of blood examination by means of the phagocytic index which had proved themselves reliable as diagnostic methods in diseases due to known organisms. The results obtained in this way led to treatment by bacterial inoculations with the particular organisms which the blood examinations had indicated as the causes of infection. In a method of investigation such as this, it had always to be kept in mind that, while the blood might give evidence of the presence of some particular organism infecting the system, that in itself did not necessarily furnish the cause of the eye affection. The possibility of more than one variety of infecting agent being present had always to be considered, and many cases presented obvious infective conditions elsewhere than in the eyes. Cases in which the eye was the only apparent site of disease provided of course more conclusive evidence, and subsequent inoculation treatment also went far toward furnishing final proofs, and was accordingly largely directed towards this end. At first, when the nature of the causal organisms producing the eye affections was almost wholly a matter of surmise or speculation, it was necessary to make the number of the organisms tested for in the blood examination extensive, so as to cover as far as possible all likely causes. At the earlier stage of the investigation, therefore, practically all the common infective bacteria were taken into account and tested for; at a later stage, by a process of exclusion, the tests became narrowed down in accordance with the evidence obtained, and in the final stage inoculation treatment was carried out on a number of patients without any preliminary examination of the blood, making use of the information so obtained in similar cases previously.

The methods of blood examination which were employed were three in number, and consisted of the inoculation test, the absorption index test, and the comparative index test, which have been described fully elsewhere.[1 2 3] The inoculation test consists in observing a negative phase in the phagocytic index following inoculation of a particular organism in persons infected with that particular organism, or the absence of such negative phase in non-infected persons.

The absorption index test is a method of absorbing from the serum those non-specific substances which influence phagocytosis, leaving evidence of the presence of specific substances influencing phagocytosis of some particular organism, but only in the case of serum from an individual infected with that particular organism.

The comparative index test consists in estimating the phagocytic index of a serum at any one time to a number of organisms. It is found that the index is the same, within the limits of technical error, to all organisms other than one with which the individual is infected. The index of such an infecting organism almost always stands at a distinctly different level, either higher or lower. This method was found to be the most suitable in this investigation, where a large number of bacteria had to be tested for in each case, and was the method therefore employed for the most part.

In regard to the tests in relation to possible tuberculosis, it should be stated that, on the basis of previous research,

it was considered necessary to test for infection with either the human, bovine, or avian types of bacillus, it having been found that the blood serum reactions as shown by the phagocytic index differ in respect of each of these, and further, that successful inoculation treatment depends on the employment of a tuberculin corresponding to the specific type of infecting tubercle bacillus.

The cases dealt with here are those in which one or other type of tubercle bacillus was demonstrated as an infecting agent, and also other cases of a similar nature in which tuberculin treatment was carried out without the preliminary serum examination described.

This differentiation between the various types of tubercle bacillus we consider of high practical importance. In certain types of case the bovine type of infection was found to be specially common, and evidence has been obtained that treatment of such cases with the human type of tuberculin is ineffective. The avian type of infection was not found in any case examined by the methods referred to.

The system of dosage followed has been that which has been found to be the most suitable where a prolonged course of treatment is necessary, as is the case with tuberculosis. It is one which has been found to obviate the occurrence of any objectionable "reactions," and which has the advantage of being suited for the ambulant treatment of patients coming, it may be, from a distance for each inoculation, as it does not need to be controlled by frequent observations of the temperature of the patient. It follows a fairly simple and definite plan, and is therefore well adapted for routine use in hospital out-patient practice, requiring but seldom any variation from the set scheme, while it necessitates as little as possible the attendance of the patient at hospital for the inoculations. It also admits satisfactorily of a renewal of the treatment at a later date if found desirable, and has the advantage from a hospital point of view of costing but a trivial amount for the tuberculin used for each patient.

The general principles are to keep the patient constantly under the influence of a comparatively small dose of tuberculin, fairly uniform in amount, but tending, as time goes on, to increase slightly; never to diminish the dose; to make no attempt to "accustom" the patient to the largest doses of tuberculin, but to aim at a gradual immunization; to avoid hypersusceptibility by giving the earlier doses at short intervals, while later, as the condition tends to come under control, to increase the intervals, as also the doses. It has not been found that anything is to be gained in the end by attempting a rapid immunization in tuberculosis, and in eye conditions the probability of deposits of tubercle elsewhere in the system in all cases has to be kept always in view. The best dosage is that which causes no obvious reaction and has the most prolonged effect. In the more acute forms the initial doses should be smaller, and the intervals between them may be shorter.

The tuberculin used has been commonly Koch's Tuberculin R, of either the human or the bovine (*Perlsucht*) type, as indicated in the particular case.

In a chronic case a typical scheme of dosage would be as follows:

Dose No.	Amount of Tuberculin.	Interval Allowed before Next Dose.
1	0.00025 mg.	1 week.
2	0.0005 mg.	2 weeks.
3	0.0006 mg.	2 ,,
4	0.001 mg.	3 ,,
5	0.001 mg.	3 ,,
6	0.00125 mg.	3 ,,
7	0.00125 mg.	3 ,,
8	0.0015 mg.	3 ,,
9	0.0015 mg.	3 ,,
10	0.002 mg.	4 ,,
11	0.002 mg.	4 ,,
12	0.0025 mg.	4 ,,

In a course such as the above there is a total amount of 0.01535 mg. tuberculin injected, spread over a period of thirty-five weeks, which gives an average of 0.00044 mg. per week, but it will be seen that the dosage per week is at first less than that, and is progressively increased.

In an acute type of infection the scheme of dosage would approximate more to the following:

Dose No.	Amount of Tuberculin.	Interval Allowed before Next Dose.
1	0.0002 mg.	1 week.
2	0.0004 mg.	2 weeks.
3	0.0005 mg.	2 ,,
4	0.00075 mg.	3 ,,
5	0.001 mg.	3 ,,
6	0.001 mg.	3 ,,
7	0.00125 mg.	3 ,,
8	0.00125 mg.	3 ,,
9	0.0015 mg.	3 ,,
10	0.0015 mg.	3 ,,
11	0.002 mg.	4 ,,
12	0.002 mg.	4 ,,

In this course the total amount of tuberculin injected is 0.01335 mg., spread over a period of thirty-four weeks, which gives an average dose of 0.00039 mg. per week, but it will be noticed that the scheme of dosage gradually falls into line with that adopted for the chronic type of case, and this plan would be followed in cases in which the acuteness of the symptoms diminishes satisfactorily at an early stage. Otherwise it is advisable to continue for a longer time with the smaller doses at shorter intervals as shown in the earlier part of the course. As a general principle, if a dose given is thought to have been too large, the next one should not be diminished, but the same may be repeated, allowing a longer interval. In any case the injections should be continued steadily and the treatment should not be started without ensuring arrangements for its continuity. In tuberculosis the results of inoculation cannot be judged from but one or two injections.

The schemes of dosage above outlined are for adult individuals, and should, of course, be proportioned according to the age of the patient.

In those cases in which inoculations were given of other organisms the doses were measured by weight in the same way as with tuberculin, and the course of treatment followed similar lines—that is to say, when two or more organisms were to be administered, one would give simultaneously an injection of the same amount of each corresponding to the dosage in the scheme of treatment which was being followed.

The injections are always made into the substance of a muscle, and the dilutions of the tuberculin, etc., made up with 0.9 per cent. saline solution.

References.

[1] Stewart and Ritchie, *Edinburgh Medical Journal*, May, 1907. [2] Ritchie, British Medical Journal, November 16th, 1907. [3] Ritchie, *Medical Press*, March 24th, 1909.

III.—Dr. Louis Dor,

Lyons, France.

If any of you were present at Berlin at the session of the International Medical Congress of 1890 you must certainly remember the enthusiasm of the whole assembly when Koch announced that he had found a remedy against tuberculosis, which he called "tuberculin." During the years 1891 to 1893 nearly all the physicians of the world tried to cure tuberculosis with the Koch tuberculin, but, unhappily, the deception became general when it was proved that the remedy was very dangerous, and that, certainly in many cases, the disease of the patients had been aggravated. This is the reason why it is now very difficult to generalize the use of new tuberculins. I had myself great hesitation in the beginning when these new tuberculins appeared, and I had on my table a tube of tuberculin T.R. for a year before I dared to inject it into a patient. It was the confidence I had in Professor v. Hippel which decided me to try the method, and I must also say that the patient—a young lady, who asked me formally to treat her with tuberculin—took away my last hesitations. I was very timid in the beginning, but when I saw the first case going well I became more and more bold.

As I have treated a large number of cases, I must tell now how it was possible that I could find out so many—nearly 80—in a period of four years. This happened because all the pupils of Poncet—amongst which I count myself—consider as being really tuberculous a large number of chronic inflammations generally attributed to rheumatic or to other infectious diseases.

I believe that a great number of cases of interstitial keratitis where the Wassermann reaction is negative, cases

of phlyctenular conjunctivitis, of chronic scleritis, quiet iritis, hyalitis, detachment of retina without myopia, iridocyclitis, optic neuritis, and so forth, may be produced by tubercle bacilli; and the best thing is to try the action of tuberculin as agent of diagnosis. In some cases there is no reaction at all. I leave these cases aside, but in the great majority of cases I found either a local or a general reaction, and I treated those cases. Of course, I treated also some cases of very typical tuberculosis of the iris, three cases of doubtless tuberculosis of the retina, but the great majority were cases of atypical tuberculosis, and this is the explanation why I could find so many as nearly 80 patients. The method I have adopted is the following—I try never to have the least reaction. I begin with very small doses (generally the one hundred-thousandth part of a milligram), and every third day I inject a higher dose. As long as I have no reaction at all I go on further. As soon as I see a local or a general reaction I inject always the same dose as long as it causes a reaction. All my patients themselves take every morning and every evening their rectal temperature, they write it down in a pocket-book, and I write beside the number of drops of the solution which I inject. The injection is made generally on the back between the shoulders.

I have never neglected to give my patients the best local and general treatment that I could imagine—atropine for iritis, dionine for keratitis, cod-liver oil, sodium cacodylate—for I tried to cure them, and not use them for experimental purposes.

I can say that I have never seen the least inconvenience of the injections. The tuberculin acts evidently on the lesion; for instance, in the tuberculous detachment of the retina the patients will see after each injection, the second day, or sometimes the same day, a great number of flashes of light; in the tuberculous iritis they feel pain; in the tuberculous keratitis the eye becomes more red. The question is to know if the action is a good one or a bad one.

If the action were rapid, nobody would have a doubt, but the action of the tuberculin is not so quick as the action of real remedies like salvarsan or potassium iodide. The action of tuberculin is always slow, and the patient, as well as the physician, needs patience. Some physicians after having tried once or twice to cure patients with tuberculin gave up the remedy. It is absolutely necessary to treat a great number of patients to have an idea of the antituberculous action of the injections. The treatment must never be shorter than two months. Even after treatments of three months, when the patients seemed quite cured, I have seen some cases where relapses appeared. A second cure is then necessary, and it can last as long as the first.

You see that the action of tuberculin on tuberculous diseases is not at all to be compared with the action of the sun on the snow, but I believe, however, that the action is really a good one, that the patients are cured better and sooner than they would have been without tuberculin, and that the injection causes no harm, either to the local disease or to the general health.

I have tried a great number of tuberculins. I began with the tuberculin of Béraneck, and tried one after the other the tuberculin T.R., the French tuberculin C.L. of Calmette, the Russian endotine, the German bacillary emulsion called B.E., and last the Rosenbach's tuberculin and also Spengler's *Immun Koerper* I.K.

I can say that in some cases I found reasons to prefer one of these tuberculins to the others, but for the great majority of my cases my preferences go to the B.E., which is not a selected poison of cultures of tubercle bacilli, but the culture itself or bacilli killed and crushed. I have never regretted to have used the B.E., and I know cases where I regretted I had used other tuberculins because the treatment seemed to me to be longer than it ought to have been.

Of course the endotine and the Rosenbach's tuberculins are too new to be judged. They are very different from the other tuberculins; C.L. is the more active and also the more difficult to handle of all the tuberculins. My opinion is that the B.E. is in the middle, that it is very easy to be used. It is also the cheapest of all the tuberculins, which may be a consideration for some people.

My conclusion is that the tuberculin treatment of all the various forms of tuberculosis of the eye never does harm when it is used with some rules, that it helps the cure of the tuberculous diseases, but it acts less quickly than one would hope, and the patients as well as the physicians need perseverance. A cure of one month is very seldom sufficient. Two or three months are generally necessary, and after a period of rest it is frequently a good thing to begin again a second cure. In very severe cases I kept my patients under the action of tuberculin more than one year, and they were finally cured.

During this meeting I have heard Mr. Butler say that he had cured phlyctenular keratitis with two or three injections of T.R. I dare say that I have seen also cases where after two or three injections the disease was influenced, but it generally appeared again very soon, one or two weeks after, and the real cures must last, in my opinion, at least one month for the simplest cases.

DISCUSSION.

Dr. W. B. MARPLE (New York) was much interested in the cases related and depicted by Dr. Mackay of so-called interstitial keratitis of tuberculous origin. The majority of his own cases gave a positive Wassermann reaction, and the remainder did not give a positive tuberculin test. He had had several cases of choroiditis with a focus of recrudescence with positive tuberculin reactions. Some cases of recent tuberculous choroiditis, with mutton-fat exudates in Descemet's membrane, quickly disappeared, but the media and choroid took a long time to clear. In tuberculous iritis in which tuberculin had been given as a diagnostic aid three times at intervals of four days no positive reaction resulted except the rise of temperature of half a degree, but the condition gradually got well, and the nodules disappeared. Relapses took place, but with subsequent treatment a cure resulted after six months. He thought that the best way was to give small and increasing doses gradually, and to continue the treatment for several months or a year.

Mr. T. HARRISON BUTLER (Coventry) said that Calmette's reaction was dangerous and inaccurate. He had seen a violent reaction, with interstitial keratitis and corneal ulcers developing after its use in eyes which were previously perfectly normal. Von Pirquet's reaction was given by 90 per cent. of all adults, and so became valueless, but it was more useful in children. He considered that the injection of old tuberculin was the only method of value in ophthalmic work. A local reaction was almost certain proof of ocular tuberculosis. He used 0.001 c.cm. followed after an interval of a few days by 0.002 c.cm. and 0.004 c.cm. He had one case which failed to react to human, but reacted to bovine tuberculin. A dose of $\frac{1}{3000}$ mg. of T.R. was the best. It should be used for several months or a year, and he questioned whether any good resulted from increasing the dose. He had seen excellent results in tuberculous disease of the uvea. Scleritis and sclerosing keratitis were frequently tuberculous and greatly benefited by the treatment. He looked upon phlyctenular conjunctivitis as a sign of tubercle somewhere in the body.

Mr. BISHOP HARMAN (London) thought that they were now justified in using a tuberculin without a preliminary and exhaustive examination of the blood and the repetition of these tests during each stage of treatment. The cutaneous tests were doubtful, and the personal equation entered so much into the blood tests. He had found the use of tuberculin after the manner detailed by Dr. Peel Ritchie safe and satisfactory. He relied upon the three following signs: The appearance of the local lesion, the temperature of the patient taken regularly, and the feeling of fitness on the part of the patient—if the patient felt out of sorts no injection was given. He raised the most emphatic protest against the assumption that phlyctenulae were always of tuberculous or paratuberculous origin. All the evidence went to show that they were usually due to some local cause. Of the cases treated at the Belgrave Hospital for ten years, 50 per cent. were cured in a week, a further 25 per cent. in a fortnight, and only 5 per cent. dragged on for months, and these were all in strumous children. Next the cure was obtained with the simplest of remedies—for example, yellow ointment, or even with castor oil drops. The cases had an "age peak" of 6 years,

which corresponded to the decay of the milk teeth and the eruption of the permanent ones, and lastly, the seat of election had a specific relation to the distribution of the fifth nerve to the supply of the teeth. These things led him to believe that the common phlyctenular conjunctivitis in children was not tuberculous in any real sense but a herpetiform eruption due to irritation of collateral branches of the fifth nerve. In the residuum of cases there were genuine tuberculous lesions, particularly in those lesions which occurred later on of the pustular sort and the combined episcleral and corneal lesions which were often, but probably erroneously, called "phlyctenular." He felt that to assign a simple lesion to a grave condition and then to claim a cure for it by vaccine treatment, when it was more easily cured by the simplest means, was to discredit vaccine treatment.

Dr. MACKAY briefly replied.

THE TREATMENT OF WORD-BLINDNESS, ACQUIRED AND CONGENITAL.

By JAMES HINSHELWOOD, M.A., M.D.,
Surgeon to the Glasgow Eye Infirmary and Lecturer on Ophthalmology in the Glasgow Western Medical School.

THE subject of word-blindness is now receiving increased attention from ophthalmic surgeons. My communication in 1900[1] on the subject of congenital word-blindness first drew the attention of ophthalmic surgeons to the importance of the subject, and in 1904 I made two communications[2] at the Oxford meeting of the British Medical Association—one on acquired, and another on congenital word-blindness. Since then many communications on the subject have appeared in the ophthalmic journals, so that it is evident that ophthalmic surgeons are now realizing that this is a subject which is worthy of careful study, as the oculist is frequently the first person to be consulted in such cases, from the very natural belief on the part of the patient that the inability to read is due to some ocular defect. Hence it is most important that he should not only be able to recognize them, but he should also know what is the best method of treatment.

The old idea was that nothing could be done for such cases, but it is now quite clear, both in acquired and congenital word-blindness, much can be done if the treatment is conducted on proper lines. The object of this communication is to attempt to convey more precise and definite information as to the line of treatment which affords the best chances of success.

It was Kussmaul[3] who first clearly pointed out that blindness for words is capable of being met with clinically as an isolated condition, and that it represents the pathological condition of a special faculty. Before the publication of Kussmaul's article, however, Sir William Broadbent[4] had already called attention to cases where the patients were unable to read printed and written words, but in these cases the inability to read was accompanied by speech disturbances, such as verbal aphasia or amnesia, in a greater or less degree. Kussmaul's exact words are, "a complete text-blindness may exist, although the power of the sight, the intellect, and the powers of speech are intact." He invented the term "word-blindness" for this condition in which the patient, though not blind, is unable to read visible words.

Such pure cases of acquired word-blindness almost always first consult the ophthalmic surgeon, as they naturally suppose the inability is due to their eyesight. The case which I reported to the Oxford meeting of the British Medical Association in 1904 was first seen by me at the Glasgow Eye Infirmary. The study of the cases of acquired word-blindness is necessary to the proper understanding of congenital word-blindness, and I therefore begin with acquired word-blindness.

The inability to read in acquired word-blindness is due to a lesion either in the angular gyrus itself (cortical lesion) or to a lesion (subcortical) interrupting the communicating fibres, and thus isolating the angular gyrus from the other cerebral centres. In the auditory and visual centres of one hemisphere only are the sensory impressions of language, visual and auditory, retained and stored up. The hemisphere selected is always that in which are situated the motor centres for speech and writing. It is thus as a rule the left hemisphere in right-handed people, so that a lesion destroying the left angular gyrus or isolating it from the other centres will render a person completely word- and letter-blind.

The case of acquired word-blindness with pathological examination recorded by me at the Oxford meeting of the British Medical Association was that of a man, aged 58 years, a teacher of French and German. He went to bed quite well, and next morning on waking he found that he had lost the power of reading both printed and written words and letters. On examination I found there was also present right lateral homonymous hemianopsia, but no other cerebral symptom was observable.

Acting on my advice this patient started the process of re-education. He got a child's primer and began again to learn the letters of the alphabet. After six months' daily practice he learnt again to recognize the letters of the alphabet, but he never learnt to read words by sight. He was never able to recognize the visual memories of words, or at the most only of a very few of the short familiar ones. He could only read by spelling out each word letter by letter, and thus appealing to his auditory memory. He thus made little progress beyond reacquiring the visual memory of letters. After labouring at this for a year, he came to me one day and said that he had given the task up. It took so much out of him, as he expressed it, and required such intense mental effort, and he was making such little progress that he felt constrained to abandon any further attempts towards learning to read.

This case, however, was so far encouraging, as the patient reacquired the visual memories of the letters of the alphabet, and of a few familiar and short words. This showed the possibility of re-education to some extent at least, and encouraged me to try the same method in the next case which came under my notice. The patient was a woman, aged 34 years, who had been completely word- and letter-blind for a period of fourteen months before I saw her. So complete was the letter-blindness that she could not recognize a single letter of the alphabet. On examination I found there was also right homonymous hemianopsia. I recommended that she should learn to read again, beginning with the letters of the alphabet, and then the short words and sentences in a child's primer. This case was a much more favourable one, as the patient was twenty-four years younger. Fortunately, also, she lived with her brother, who, being a schoolmaster, was greatly interested in this process of re-education, and undertook the supervision of her re-education.

I asked her brother to give me some account of his experience in teaching her to read, and I quote the following from the notes which he kindly sent me:

> On July 19th, 1900, my sister became paralysed on the right side, and also became word- and letter-blind, both for printing and writing, but could to a considerable extent recognize figures. By September, 1900, she had recovered the power of her right arm and leg and improved in her general health, but her inability to read remained just as before. Her medical attendant, Dr. Miller Semple, advised that Dr. Hinshelwood should be consulted, and in September, 1901, Dr. Hinshelwood, after seeing her, advised that an attempt should be made to re-learn to read. Ordinary day-school primers were recommended, the print being big and the lessons graduated. Generally speaking, the task of re-learning was found to be twice as difficult as the learning of letters and words for the first time, but as the auditory memory was unimpaired the task was to some extent easier, for she could spell words when she could neither recognize them, nor even the letters of which they were composed. She could not study at first for more than ten minutes at a time, as exhaustion soon came on and she had to stop. Slowly and with the greatest perseverance she succeeded in learning the alphabet and little words. The first primer (words of four letters) was mastered in about ten weeks, greatly by the help of the auditory memory; and by July, 1902, she was reading simple Bible texts, but spelling most of the words letter by letter.
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> Since July, 1902, her progress has been steady but slow. In common narrative a large proportion of the words are now not spelt at all, and of those which she requires to spell few have now to be spelt aloud. She often stumbles yet at small words, and gets easily over big words, the appearance of the latter being often more characteristic.

I have recently had an opportunity of seeing this patient and hearing her read after an interval of more than ten years; her homonymous hemianopsia remained unchanged. She read an article from a newspaper very fluently, but occasionally stopped and spelt out a word before she was able to read it, but this occurred only very rarely. Her brother's account of her re-education gives us a very clear idea of the process. She first acquired the visual memory of the letters of the alphabet. This is a comparatively easy task, as there are only twenty-six letters, and, taking

capital and small letters, only fifty-two visual images to be registered in the visual memory. Her auditory memory was unimpaired, and hence when she could recognize the individual letters she could read by spelling aloud the words and appealing to her auditory memory. It was in this way that she gradually acquired the second stage in the art of reading, which is a much more formidable task and requiring for its accomplishment a much longer period of time. In fact she has not yet thoroughly mastered this stage, although she is fairly proficient, finding it necessary even yet occasionally to spell a word. This second stage consists in the gradual acquirement and storage of the visual memories of words. When this is accomplished the individual reads not by analysing each word into its individual letters, but by recognizing each word as a separate picture. The words then cease to be for such an individual simply a congeries of letters; each word is regarded rather as an ideogram, picture or symbol, which suggests a particular idea. The individual now recognizes a word, just as he recognizes a landscape or a familiar face, by its general outline and form without resolving it into its constituent details. He has now learnt to read by sight, and can skim over the pages of a book with great rapidity. When he looks at a printed or written word he can instantly interpret it by comparison with the word-image in his visual memory without having recourse to his auditory or glosso-kinaesthetic memory. To acquire this art of reading by sight alone requires the storing up in the visual memory of an enormous number of visual images of words, and many people never perfectly acquire it, but, like our patient, occasionally require to pause and analyse the word, spelling it out letter by letter.

In April, 1905, a girl 14 years of age was brought to me with the history that eighteen months ago she became paralysed on her right side, with loss of speech. She gradually recovered from her hemiplegia and aphasia, but it was then found that she was unable to read, and had remained in that condition ever since. Before her illness she was in the fourth standard at school, and could read very well. When I examined her I found that she had right homonymous hemianopsia, and was completely word- and letter-blind, not being able to recognize a single letter of the alphabet. Her auditory memory was unaffected, and she still retained the power of spelling.

I therefore advised that she should be re-educated, beginning with the alphabet and then with a child's primer. After learning the alphabet she was to be allowed to spell out aloud the words letter by letter, and thus appeal to her auditory memory which was unaffected.

I saw her again four months afterwards, and found that she had made considerable progress in that time. She could recognize by sight all the letters of the alphabet, and could pick out by sight a large number of small words, such as "to," "up," "go," "in," "the," "of," and so forth. Larger words she could read by spelling them out letter by letter, and so appealing to her auditory memory. Her hemianopsia remained the same.

I learnt later from her medical attendant that her progress in relearning to read had been continuous. Her education was undertaken by her father, who spent a great deal of time in training her, and in two years after I saw her, she was able to read just as well as ever, although her hemianopsia persisted.

The ease and rapidity with which this child relearnt to read was very striking as compared with the other two cases. It is evident, then, that age is a very important factor in the prognosis of such cases, and that the younger the patient the less will be the difficulty in teaching them to read again.

In the three cases recorded, and in many such cases, the cause of the word-blindness was cerebral haemorrhage, which either destroys the angular gyrus itself (a cortical lesion), or, leaving it intact, may destroy the fibres leading to it—a subcortical lesion. In the three cases recorded the word-blindness was accompanied by lateral homonymous hemianopsia, which points to a lesion in the white matter of the left occipital lobe, so situated as to cut across the fibres passing from both occipital lobes to the left angular gyrus, and also involving the optic radiations passing to the left occipital cortex. It is important in such cases that the process of re-education should not be started too soon.

Complete cerebral rest is essential after such an attack for a considerable time, and no attempt at re-education should be made until all signs of acute brain disease have disappeared. The right homonymous hemianopsia remaining permanently in all three cases showed that the left angular gyrus was permanently cut off from the visual centres in both occipital lobes.

Re-education in these cases could therefore only be accomplished by the education of the corresponding centre on the opposite side of the brain, and hence the greater difficulty in teaching such patients to read by sight, as they require for that purpose to use a part of the brain which does not usually discharge that function. It will be noted also that in these cases the auditory centre in the first convolution of the temporo-sphenoidal lobe was unaffected, and hence these patients retained the power of spelling words even when they could no longer recognize them by sight. Word- and letter-blindness has not always the complete character of the three cases just recorded. There are often peculiar varieties and partial forms which I have discussed in detail in my book on word-, letter- and mind-blindness.[5]

The study of these cases of acquired word-blindness with auditory memory centres intact and their method of relearning to read gives us a clue to the proper method of education in children suffering from congenital word-blindness but who have good auditory memories, and who therefore belong to a very similar category.

It was the study of acquired word-blindness which led to the recognition of the cause of the inability or difficulty in learning to read, which is seen in many children, as being due to a congenital defect in the visual memory for words and letters, and which hence could be conveniently described as congenital word-blindness. That these cases are comparatively numerous is now evident from the large number of recorded cases which have appeared in the ophthalmic journals during the last few years. The important point is that these children can be taught to read, if it is set about in the proper way. But the question arises, what is the proper way? Now this is the point to which I wish to draw special attention, as I am not in agreement with many recent writers on this subject. Mr. Herbert Fisher[6] in a recent and interesting communication to the Ophthalmological Society on congenital word-blindness, quotes a case of his own, where the patient was successfully taught to read on the "look and say principle," "a system," he says, "in which the word or at most the syllable, is made the unit for visual memory, instead of the individual letter." He advocated this method of teaching such children as being *a priori* that which might be expected to be the most ready way of practically meeting the difficulty.

A case which has recently come under my observation affords conclusive proof that whilst the method of training recommended by Mr. Fisher may be most successful in some cases, as he has found it, yet there are others where this method will not succeed, and where the child must be trained in a different way.

In March, 1911, a boy, 13½ years of age, was brought to me with the history that he could not be taught to read. He had been seven years at school. He had made good progress in writing, copied very well with a beautiful hand. He was good at drawing and fair at arithmetic. He had been taught to read entirely on the "look and say" principle, and had not been taught to spell. When I examined him I found that he knew most, but not all, of the letters of the alphabet, and could recognize by sight many small words of one syllable, but this was all he could accomplish after seven years' training on the "look and say" system.

I found that the boy had a good auditory memory, and, profiting by what I knew of the process of re-education in acquired word-blindness, I advised that the boy should be taught to read on the old method, beginning with the letters of the alphabet; and as he already knew most of these, he would probably not be long in learning them all. I then advised that he should be taught to spell, and then to read the simple words in a child's first primer, spelling them out letter by letter, and so appealing to his auditory memory, which was good. In this way the auditory and visual centres would be trained simultaneously.

I saw the boy in April last, and found that his progress had been continuous and rapid, much to the surprise of his parents. He was now reading fairly well words of two and three syllables, and had made more progress in the last thirteen months than he had made in the preceding seven years when taught on the "look and say" principle.

It is evident, then, that the "look and say" principle of learning to read was not the proper method in this particular case. In the "look and say" method the child is taught to recognize printed words as a whole, not to recognize the words by spelling them out letter by letter, and hence it is claimed that the child learns to read more rapidly, as this process of reading by visual recognition alone dispenses with the necessity of the child learning to

spell before learning to read, as in the old method. Now while this may be true of a child with a normal visual memory, it is to be remembered that the conditions are entirely different in cases of congenital word-blindness, where the difficulty is dependent upon a defect of his visual memory.

I do not say that all cases of congenital word-blindness ought to be taught on the old system, and that none should be taught on the "look and say" system, but I do say that, whilst some cases may be taught on the "look and say" system, other cases cannot be taught to read in this way. The method of teaching will depend upon the degree of defect in the visual memory and upon the condition of the auditory memory. When the visual memory is very defective and the auditory memory is good, then the old system is the method by which the best results will be most rapidly attained, as is exemplified by the case which I have just narrated.

When the auditory memory is good the child can rapidly learn to spell, and will be able to spell the words fluently long before it has learnt to recognize them by sight. The letters of the alphabet are soon mastered, as there are only 52 in all, taking both capitals and small letters. If the auditory memory is now furnished with the spelling of the words, the task of learning to read is greatly simplified, as the child has simply to recognize by sight the individual letters, and is now able to read the word by spelling it and appealing to the auditory memory. In this way the child with defective visual and good auditory memory acquires both more easily and more rapidly the visual images of the words, which when permanently registered in the visual memory centre will enable it ultimately to read without spelling.

In cases, however, where the auditory memory is not good, I think the best results might be obtained by the "look and say" system. In such cases attempting to teach the child to spell is only increasing the difficulties of the task. We are then attempting to educate two defective memory centres instead of concentrating our attention upon one. In cases of congenital word-blindness, then, with defective auditory memory, I would approve of the child being taught on the "look and say" method.

I have in other papers,[7 8 9] insisted upon the fact that these defective children cannot be taught in class along with normal children. The great difficulty they experience excites the ridicule of other children and is a great source of discouragement to the affected child. In many large centres there are now schools for training defective children, but I do not think that the children suffering from congenital word-blindness should be taught even there in class. The degree of the defect varies very considerably, and as I have attempted to show, the method of instruction is not uniform but must be adapted to the needs and peculiarities of the particular case. Each child should be taught alone.

I always advocate a number of short reading lessons every day rather than one long one. In re-educating the patients with acquired word-blindness, it was always noticed that the brain became exhausted in a comparatively short time, and in these cases of congenital word-blindness, the effort involved in trying to store up the visual images requires a much greater degree of concentration than in children with normal visual centres. The visual impressions, too, must be very frequently repeated, before they remain permanently in the brains of these patients. Hence the proper treatment is by short and frequent lessons during the day without anything leading to exhaustion. I have often found great assistance from the use of block letters in teaching these patients to read, thus deepening the visual impressions by associating them with tactile ones. Above all, patience and perseverance are most important factors in the successful treatment of every case of congenital word-blindness.

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DISCUSSION.

Dr. F. W. Edridge-Green (London) quite agreed with the method suggested by Dr. Hinshelwood of training the memory. He had found it was of the greatest importance to put as little strain as possible on a weak faculty. It was important to remember that the retina was represented in the cerebrum; we might almost speak of there being a cerebral retina.

INTRAOCULAR HAEMORRHAGE.

By W. B. Inglis Pollock, F.R.F.P.S.Glasg.,

Assistant Surgeon, Glasgow Eye Infirmary; Ophthalmic Surgeon, Ayr County Hospital.

Haemorrhage within the eyeball may occur in a number of conditions. Small haemorrhages are frequently present in the retina in various diseases of the blood, and in certain retinal affections. Even when they are fairly numerous, if the macular region is not involved, vision may not be much impeded. But if a haemorrhage, however small, is situated in the fovea centralis, it then becomes of importance, apart from disease of this portion of the retina, which is so prone to be affected in many different conditions, of which syphilis, myopia, and senile degeneration are perhaps the most frequent. In this paper it is proposed to discuss the etiology and prognosis of intraocular haemorrhages which may produce transitory or permanent blindness, apart from those due to traumatism.

Haemorrhage at the macula may be absorbed, but if the retina is destroyed by it central vision will be lost, although, should the remainder of the retina be healthy, good peripheral vision will be preserved.

Such cases are common in thrombosis of the retinal vein and in albuminuric retinitis.

Post-operative haemorrhage deserves special mention. It may occur during the operation, during the first night, at any dressing, or on any subsequent day until the closure of the wound. It is generally of choroidal origin, and produces at once a complete separation of the retina. The entire contents of the eyeball may be expelled, and the bleeding may saturate the dressings. As sympathetic inflammation may follow this most lamentable accident, enucleation of the unfortunate eyeball becomes often imperative.

During the three years of my position as pathologist to our Eye Infirmary in Glasgow I had the opportunity of examining several eyes removed upon account of this danger. The haemorrhage in all cases was of choroidal origin, and filled the eyeball. The retina was completely separated except at the optic nerve, where it is anchored by the nerve fibres. It is difficult to say how to prevent such an occurrence, but all eye operations should be dressed with the greatest gentleness. The wool should be applied so as to form a "nest," and the bandage put on firmly, but without undue pressure.

The common form of intraocular haemorrhage is that known as the "subhyaloid." It is most frequent in men. The comparative rarity among women is believed to be due to the function of menstruation. Cases in women have been reported. One coincided with the sudden suppression of menstruation, one with the climacteric, and one with violent vomiting in the sixth month of pregnancy.

Constipation and gout are important predisposing factors. Any severe strain may be the exciting cause. The following is a typical case:

J. C., aged 53, golf starter, came to me on August 30th, 1910, with the statement that two days earlier, while straining at stool and coughing, the vision of the right eye suddenly became obscured. He states that he saw red streamers going out in front of him. On looking at a light he saw a half red moon. Upon examination, a large central scotoma was found, but he could count fingers at 1 ft. towards the periphery of the field of vision. Vision of the left eye $\frac{6}{5}$ (letters). With the ophthalmoscope a large haemorrhage was seen occluding the macula. It projected into the vitreous like a mushroom with diverging processes. He was ordered to lie in bed in a darkened room with smoked glasses; mag. sulph. with pot. cit. prescribed, and placed under the care of his own physician, Dr. Roxburgh of Troon. On September 30th, 1910, the vision of the right eye was $\frac{1}{60}$. On July 17th, 1912, vision right eye $\frac{6}{5}$ and Jaeger No. 2 without glasses. Vision left eye $\frac{6}{5}$ (letters) and Jaeger 2 without glasses. The fundus of each eye was perfectly normal, and not a trace of the haemorrhage could be found in the right eye.

These haemorrhages are nearly always situated at the macula, and are generally of a hemispherical shape, often with the superior margin delimited by a horizontal line. It is rare to find a second haemorrhage at another part of the fundus. A fresh haemorrhage may be superimposed on the first. The red colour is often maintained for a long period, and it has been thought that during this time the blood remains fluid. Pigment is occasionally observed in the retina after the haemorrhage is absorbed, and is probably due to blood pigment deposited in the retina.

One case has been examined *post mortem*.[1] In it the blood was found spread out on the inner surface of the retina, with the internal limiting membrane detached over it, and covered also by the hyaloid membrane of the vitreous. These two sheets were perforated at one spot, and the blood had entered the vitreous to a slight extent, but this appears to be uncommon. The fact that the vitreous often shrinks from the fovea centralis of the retina during hardening of the eyeball has suggested that the great frequency of these haemorrhages at the macula is due to the apparently slender attachment of the hyaloid membrane in this area.

Notwithstanding much early writing and argument in favour of an arterial source, it is now generally believed that in almost all cases the blood comes from a ruptured vein. Bleeding ceases spontaneously, not by coagulation, but by a rise of the intraocular pressure, which compresses the ruptured vessel. It is easily understood, further, why the retina and the vitreous body are rarely penetrated by blood escaping from a venous leakage. Recovery of good central and peripheral vision is therefore the rule, as Mr. Hill Griffith[2] reported, and as in the case described above.

REFERENCE.

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DISCUSSION.

Mr. WORTH said that it was usually said that spontaneous intra-ocular haemorrhage was very much more common in males than in females, and a speaker at a recent meeting of the Ophthalmological Society of the United Kingdom said he had never seen a case in a female. Mr. Worth said he had seen several cases in females; two cases he wished to mention: 1. A young lady, a patient of Dr. J. D. Rice, who for several months had suffered from haemorrhage into the vitreous of one or both eyes just before each menstrual period. As all treatment proved of no avail and the patient was obviously becoming blind, after consultation with physicians, removal of both ovaries was performed. It did no good; and the patient became blind. 2. A girl, aged 18 years, a patient of Dr. Mayo, of Cowes, had one haemorrhage in one eye and one in the other. The patient was anaemic, and her blood coagulated slowly. Iron and potassium iodide produced a cure.

Mr. EALES mentioned a singular case of a patient who was affected with recurrent retinal haemorrhages, and who, up to 17 years of age, was supposed to be a female, but then developed decided evidences of his male character about the time of onset of the haemorrhages. Tuberculous choroidal disease in his experience had in a few cases been accompanied by recurrent intraocular haemorrhage, but he still believed that there was a peculiar vasomotor condition underlying the special class of recurrent intraocular haemorrhages which appeared to affect young men from 19 to 25 years of age, as described by him many years ago.

Dr. J. GRAY CLEGG said he had had several cases of repeated haemorrhages into the vitreous in young persons. The coagulability of the blood had been investigated where there was no evidence of tubercle, and in one case where it was below normal calcium lactate seemed to be of great service.

Dr. IGERSHEIMER (Halle) said he had just published a paper about tuberculosis as an etiological factor in intraocular haemorrhage in young persons. In one case he had seen very encouraging results with tuberculin treatment and had seen local reaction take place. In two other cases evidence seemed to point to their being tuberculous, but not so clearly as in the case mentioned above.

DISCUSSION ON SALVARSAN IN DISEASES OF THE EYE.

OPENING PAPER.

By SYDNEY STEPHENSON, M.B., C.M.Edin., F.R.C.S.Eng.,
Ophthalmic Surgeon, Queen's Hospital for Children.

(Abstract.)

IN opening the discussion, Mr. SYDNEY STEPHENSON limited his remarks to the action of salvarsan in syphilitic diseases of the eye. The remedy, he thought, was best given in series by the intravenous route, and he was of opinion that it should be supplemented by mercurial inunctions. He did not believe that it had any harmful effect upon the optic nerve, healthy or diseased. Its administration did not of necessity prevent the subsequent appearance of syphilitic disease of the eye. In the treatment of interstitial keratitis due to inherited syphilis, good results might be obtained by a series of injections, but a single injection, in Mr. Stephenson's experience, seldom produced any marked effect. Salvarsan acted better and more speedily than mercury in the irido-cyclitis of secondary syphilis. Mr. Stephenson considered that the serum reaction should throughout remain the touchstone as to the efficacy of treatment and the permanence of cure. The continued absence of clinical manifestations had less value.

DISCUSSION.

Dr. W. B. MARPLE (New York) deprecated premature conclusions as to the value of salvarsan in eye work. At the same time, he had used salvarsan in interstitial keratitis, and in specific iritis accompanied with a gumma or papule of the inflamed iris. In the former disease it had little effect, while in the latter it acted admirably.

Dr. IGERSHEIMER (Halle) discussed at some length the nature of salvarsan and other organic arsenic compounds. From salvarsan he had obtained excellent results in cases of iritis papulosa. As regards interstitial keratitis, his results had become much better since he had employed not one but several injections of salvarsan. For example, improvement resulted in 5 per cent. of his 39 cases from a single injection, in 25 per cent. of 24 cases from two injections, and in 36 per cent. of 11 cases from three injections. The Wassermann reaction became negative in a large number of the patients treated with salvarsan, whereas under treatment by mercury alone it seldom became negative, or at most did so after lapse of several years. This point was important in the decision as to the particular treatment of interstitial keratitis, since their aim was not only to cure the local manifestation, but the underlying disease itself. On this account salvarsan was to be preferred to mercury. He had seen good results follow the administration of salvarsan in recent disease of the retina and optic nerve, whether due to acquired or inherited syphilis. It often acted excellently in inflammatory affections of the uveal tract. In 3 cases of ocular paralysis good results were obtained. As to neo-salvarsan, he had found that when injected in massive doses into rabbits the animals died very quickly. Injected into the corneae of the same animals, weak solutions produced temporary opacity, and stronger ones cloudiness that lasted for a much longer time and was more intense. Local necrosis sometimes followed injections of neo-salvarsan beneath the conjunctiva. In two female patients neo-salvarsan, in doses corresponding to 0.3 gram of salvarsan, gave rise to disquieting symptoms soon after the injection, such as vertigo, delirium, and hallucinations, but these were regarded by him as an exaggeration of already existing syphilitic manifestations. In several cases of interstitial keratitis a single injection of neo-salvarsan yielded results that he had never seen from a single injection of salvarsan. In conclusion, he considered that both salvarsan and neo-salvarsan, if not exactly ideal, were good remedies in diseases of the eye. The former was indicated in diseases of the retina and optic nerve, and the latter in affections of the anterior parts of the eye.

Mr. S. H. Browning (London) confined his remarks to the treatment of sympathetic ophthalmitis by means of salvarsan. About two and a half years ago Ormond and Price-Jones found that the differential blood count of patients with sympathetic ophthalmitis showed a large increase in the large mononuclear leucocytes at the expense of the polymorphonuclear variety. Mr. Browning had independently been conducting blood counts on cases of sympathetic ophthalmitis, and had obtained similar results. Since this type of count was peculiar to the blood of patients suffering from protozoal diseases, it seemed natural to conclude that sympathetic ophthalmitis might also be a protozoal disease, and since salvarsan was used so successfully in those diseases, that it might also be of use in the eye affection. Some 27 cases of sympathetic ophthalmitis had so far been treated on those lines with more or less success. In every case there was temporary benefit, and in three cure resulted. An interesting point was that the blood count approached the normal within forty-eight hours after the injection of salvarsan, but it unfortunately returned to the protozoal type of count again in about thirty days. Further doses of salvarsan again brought the blood count to normal.

Dr. A. Maitland Ramsay (Glasgow) had employed salvarsan or neo-salvarsan in 22 cases of syphilis of the eye (20 chronic and 2 acute). The intravenous injection of those remedies was followed, preceded, or both, by the systematic administration of mercury. The clinical diagnosis of syphilis was confirmed in every instance by the Wassermann test. In Ramsay's experience, there was no difference in the therapeutic results obtained by salvarsan and neo-salvarsan respectively. The rapidity with which salvarsan acted was its outstanding feature. It quickly controlled an acute case, and, if given in time, prevented permanent damage to the delicate structures of the eye. But there was good reason for doubting whether by itself it was truly curative, and his experience with the remedy supported the view that the most trustworthy results were obtained when salvarsan was combined with a course of mercurial treatment. He had noted recrudescences of the disease after salvarsan had been injected, but these he regarded not as due to any noxious action of the drug, but rather to a further manifestation of syphilis. He doubted whether salvarsan exerted any poisonous effect upon the tissues of the eye. The more recent the infection the better did salvarsan act. In chronic infections its effect was neither so rapid nor so manifest. In the cure of syphilis mercury was as necessary now as ever it was. The value of salvarsan lay in its power of destroying the spirochaetes before they had time to damage the delicate structures of the eyeball. It prepared the way for the mercury, and consequently the one drug was the complement of the other. Neither should local treatment be neglected. The judicious application of leeches, counter-irritants, and subconjunctival injections, as well as the use of pilocarpin hypodermically, were valuable adjuvants to the constitutional treatment, and their use at the opportune moment might make all the difference between success and failure.

Mr. Bishop Harman (London) said he was in the fortunate position of being able to overlook the work of his colleagues in a general hospital where salvarsan was extensively used. It was their custom to prepare a patient as for a major operation, and to give two or three injections at intervals of a week. So far he had not seen any deleterious effects upon the optic nerve, and in some cases of cerebral syphilis with optic neuritis they had benefited considerably, but in one there had been a sharp relapse. Among eye diseases he had not been able to find any advantage in its use in interstitial keratitis, even when used with three injections in a recent and acutely vascular case. Again, it had failed in a case of rapidly advancing choroido-retinitis; but so also had mercury. He acknowledged its successful influence in acute iritis, but he did not advise it in such single ocular lesions which were readily ameliorable to other and completely harmless measures. The case was different when general symptoms of the disease existed. In acute cyclitis, with rapidly increasing vitreous opacities, and in syphilitic optic neuritis its use was warranted, for rapidity of treatment was essential. In cases of lesser severity it should only be given when the risks had been fully explained to the patient, for there were risks. He had seen serious ocular paralyses follow immediately on the injection, and there were known cases of inexplicable and sudden fatal results even when administered by perfectly competent hands.

Mr. Nimmo Walker (Liverpool) said that he had not yet used salvarsan, and mentioned four cases which had come under his notice and caused him to hesitate—two, one of interstitial keratitis, the other of gummatous iritis, occurring after the use of salvarsan, showed that it had been unsuccessful; the other two, one of papillitis, the other of acute retrobulbar neuritis with myelomalacia, might be due to the syphilis or the salvarsan. He felt that general principles must not be forgotten, and that there must be risk in the injection of so large a dose of arsenic; of course, it was said that arsenic in this form was non-poisonous, but the same had been said of atoxyl, arsacetin, and soamin, and proved to be untrue.

Mr. Inglis Pollock (Glasgow) said he would like to add a word of caution. Atoxyl was given in large and increasing doses, but it was two years before the first case of blindness was reported, and within a short time about two hundred were placed on record. He had seen a child of 7 with slight optic neuritis and paralysis of the pupil; six months later, during which time she was under mercurial treatment, the vision was normal, and the mother stopped treatment. Three years later she had complete optic atrophy. The next two children became affected with paralysis of the pupil on reaching 7 years of age, and now after three years their vision was normal. Had he given salvarsan no better results could have been obtained and it might have been worse.

Mr. A. L. Whitehead (Leeds) gave statistics of cases treated by him. He had had 37 cases of interstitial keratitis, 22 of syphilitic iritis, and 1 of syphilitic retinitis. All these cases gave positive Wassermann reactions before treatment; 17 had had intramuscular injections, 8 combined intramuscular and intravenous, and all the later cases (34) had intravenous injections only. He prepared his patients as for a general anaesthetic, and gave 0.3 to 0.6 gram, according to age. He had seen slight vomiting, some headache, a moderate rise of temperature up to 100.4°, and, after intramuscular injections, some local pain for a few days. They remained in hospital from seven to nine days. In acute iritis the results were striking and satisfactory, and 1 case of retinitis recovered rapidly. In interstitial keratitis only 2 showed any improvement. In 3 one eye only was affected and in 1 of them the other eye subsequently became involved. He concluded that salvarsan was excellent in acute iritis, but useless in intestitial keratitis.

Mr. Jameson Evans (Birmingham) said he had used salvarsan on a few cases with satisfactory results, including one case of interstitial keratitis with marked photophobia and trigeminal neuralgia which had resisted ordinary forms of treatment. He had given neosalvarsan in one patient who had been prepared as for a major operation, and freshly distilled sterilized water was used for making the solutions, but in spite of this the patient had sickness, headache and dizziness, and a temperature of over 100° for twenty-four hours after the injection. He did not think that this result could be ascribed to extraneous matter in the saline and salvarsan solutions.

Dr. Antill Pockley (Sydney, N.S.W.) briefly referred to the experience of salvarsan in ocular disease on the other side of the world. The most marvellous results followed on its use in the first case in which he had seen it employed, and he had then thought that they had got a most powerful new remedy, but he had seen no such effects in subsequent cases. The patient, a medical man, aged 50, got inoculated on the finger at a confinement, and, as frequently happened in cases where syphilis was contracted in an "illegitimate" way, the secondary manifestations were very severe. The patient got meningitis, and he (Dr. Pockley) was asked to examine the eye and see if there were any retinitis. One eye had been lost in early life; the other was quite normal, as was vision. Some months later the patient, looking a complete wreck,

appeared at his consulting room, nearly deaf, scarcely able to walk, and so blind that he could only just see the chair, and aided his vision by groping for it. There was intense acute serous iritis with much exudation into the anterior chamber and posterior surface of cornea; much injection, no reflex from the pupil, and temperature was very high. Next morning (Sunday) he was given an injection of 0.5 gram salvarsan intravenously. On Monday afternooon all injection and exudation had disappeared, the eye was quite clear, tension was normal, and he read the newspaper to me. The deafness was also gone. However, he died a few months later from other syphilitic sequelae. As regards interstitial keratitis, he had tried salvarsan in many cases, all intravenously and all administered by an expert, and sometimes repeated twice. He had never got any better results than with ordinary treatment by mercury and atropine. In iritis he had had better results. He had had no untoward results, but in a neighbouring hospital a patient had died suddenly after an injection given for some non-ocular syphilitic condition.

OCULAR IMBALANCE AND AUDITORY AFFECTIONS:

AN INVESTIGATION INTO THE RELATIONSHIP.

By A. ALISON BRADBURNE, F.R.C.S.Edin.,
Manchester.

THE subject of the relationship between the balance of the eyes and auditory affections has not yet received a great amount of attention, and what has been accomplished relates mainly to the phenomena associated with nystagmus; that other imbalances are probably present is what we would expect from the rôle the two organs play in the maintenance of the equilibrium of the body.

One of the earliest workers at this subject was Hunter, who discovered that rotation of the eyeballs takes place simultaneously with the movements of the head. It was Flourens who first noticed that injury of the semicircular canal was accompanied by twitchings of the eyes. Purkinje noticed similar convulsive movements of the eyes when studying vertigo in the human subject. Other observers followed, but none appreciated the real connexion between the eye and the ear until, in 1870, Goltz established the fact that the semicircular canals played the part of the organ of equilibrium for the eye movements.

Soon afterwards, in 1873, Brener and Crum Brown were able to state that the nystagmus which accompanies vertigo is produced in the semicircular canals. Ewall showed by experiments in 1892 that definite movements of the lymph in one of the canals always produced a corresponding movement of the eyeball. Javal, Nagel, and others showed that active or passive movements of the eyeball produce a compensatory rotation of the eyeballs, and Brener says that when the head is turned to one side, the eyeballs, after a few moments, follow the motion of the head.

Kreidal pointed out the interesting fact that in the majority of deaf-mutes, in whom defects exist in the semicircular canals, these eyeball movements are wanting.

The relationship between the labyrinths and the eyes is proved by the well-known fact of the appearance of nystagmus, which accompanies irritation of the semicircular canals, and that the balancing function of the canals can be taken up by the optical organs is evidenced by the effects of their removal in middle life.

In such individuals on whom this operation has been performed a condition of "utter bewilderment" exists when the eyes are shut, and if attempts at moving are made the patient collapses in a heap on the floor. When, however, the eyes are opened the gait becomes normal. The steadiness which the vision restores to such is derived from the judgement of space and distance which the possession of "binocular" vision affords.

Now in normal individuals estimation of the relationship of the visible objects around us to the poise of the body is the outcome of a combined impression derived from the visual and vestibular organs. The "vestibular factor" comes from the semicircular canals, and the visual from the binocular faculty. The faculty of binocular vision consists in bringing the optical axes of the two eyes to so bear on an object that a picture of it is simultaneously formed on corresponding portions of each retina. The two images thus recorded are blended in the brain so that we become conscious of but one single picture. This physical blending into one picture of an object seen from two sides gives depth and perspective to our outlook, and to attain this entails accurate adjustment of the optical motions around three axes. If we consider what takes place when we look at a horizontal line we shall better understand these movements. If the ocular movements from side to side be defective the line will appear lengthened, if one eye be on a different level two lines would be seen one above the other, and if the rotation of the eyes about a fore and aft axis be unequal a crossed or scissor-like appearance of the line will result. The adjustment of the ocular motions around these axes is governed by centres known as the "conjugate centres." If, then, we alter the position of our line so that the gaze is directed down and out, it is obvious that the blending of the two images must entail a complicated adjustment of the optical axes and a delicate control on the part of the conjugate centres. Substituting, then, for our horizontal line the horizon itself, which forms the chief factor in the maintenance of the equilibrium of the body, it is plain that the conjugate centres adjusting the optical axes must take into consideration the tilt of the head or body. The semicircular canals, we know, teach us the degree of such tiltings, and it seems but natural they should similarly instruct the conjugate centres. If, then, this assumption be correct, we should naturally expect to find disturbances in the conjugate movements when the canals are affected by disease or irritation.

Further, seeing the relationship which exists between the poise of the body in the maintenance of the erect position, we might also expect to find in labyrinthine affections disturbances in the conjugate movements of the eyes which have to do with the recognition of the vertical, or, in other words, defects in the ocular motions around the fore and aft axes. That this is really so I believe is true, as out of seven cases of labyrinthine affections which I have examined all but two showed that the vertical meridians of one or both eyes tended to lean outwards at the upper end. In the two exceptions the implication of the labyrinths was not absolutely certain, and in these the conjugate disturbance consisted in a difference in the horizontal level, one eye being higher than the other. This horizontal disturbance, on the other hand, was a feature in 3 out of 4 cases of temporo-sphenoidal abscess, in 1 case of serous meningitis, and in 2 cases of lateral thrombosis. The eye on the affected side was the lower in 3 cases and the higher in 2. The only exceptions are a cerebellar abscess in which no imbalance was present, and an extradural abscess in which the vertical meridians were leaning out in both eyes.

In the course of my investigations I examined a large number of cases in which the radical mastoid operation had been performed, and at first was puzzled by the results obtained. The vertical meridians were at fault in 6 and the elevation in 5. I think, however, this variation in the findings can be accounted for by the close relationship which exists between this region and the deeper and more internal structures. I examined also cases

Cases in which a Radical Mastoid Operation was Performed.

Case No.	Ear.		
66	Left	Radical mastoid operation	Left eye down; right eye normal.
59	Right	"	Right eye down; left eye up.
68	Right	"	Right eye down; left eye normal.
3	Left	"	Vertical meridian of left eye leaning out.
7	Right	"	Vertical meridian of left eye leaning out.
14	Right	"	Vertical meridian of left eye leaning out.
15	Left	"	Vertical meridian of right eye leaning out.
18	Right	"	Vertical meridian of both eyes leaning out.
17	Left	"	Vertical meridian of both eyes leaning out.
43	Left	"	Both eyes raised.
44	Left	"	Both eyes raised.

Intratympanic Affections.

Case No.	Ear.	Condition.	Ocular Balance.
60	Right	Otitis media	Left eye vertical meridian leaning towards right side.
31	Right	Acute mastoiditis and otitis media	Verticle meridians of both eyes leaning out.
53	Right	" "	Vertical meridian of right eye leaning towards right side.
72	Right	Acute otitis media	Vertical meridian of right eye leaning towards right side.
71	Left	Otitis media	Vertical meridians of both eyes leaning towards right side.
69	Left	Otitis media and mastoiditis	Left eye lower.
67	Left	Otitis media	Left eye down; right eye up.
63	Left	Otitis media	Left eye down; right eye up.
54	Left	Otitis media and mastoiditis	Left eye up; right eye normal.
28	Left	Ossiculotomy	Vertical meridian of left eye leaning out.

Expetrosal Complications.

Case No.	Side Affected.		
77	L.	Radical mastoid operation had been performed a few days before; condition of pulse very suspicious of abscess in temporo-sphenoid	Left eye lower than right; right eye normal.
51	L.	Temporo-sphenoidal abscess and mastoid operation 4 years previously; return of discharge, pain, and dizziness, pulse rapid, no nystagmus	Left eye higher than right; right eye normal.
62	L.	Temporo-sphenoidal abscess and mastoid operation 4 days previously; pupils equal	Left eye down; right eye raised.
55	L.	Lateral thrombosis, operation 6 years before examination	Left eye down; right eye up.
61	L.	Lateral thrombosis, operation 4 days before examination	Left eye down; right eye up.
76	R.	Cerebellar abscess, radical mastoid operation 4 days before examination	Right eye down; left eye normal.
52	R.	Temporo-sphenoidal abscess, radical mastoid operation 15 years before examination	Right eye up; left eye normal.
26	R.	Cerebellar abscess, radical mastoid operation 2 years before examination	No imbalance.
30	R.	Serous meningitis, suppurative otitis media, operation 6 weeks before examination	Both eyes raised.
2	L.	Extradural abscess over temporo-sphenoidal lobe, operation recent	Both vertical meridians leaning out.

Affections of the Labyrinths.

Case No.	Side Affected.		
1	R.	Discharge for years. Labyrinthotomy operation, recent	Vertical meridians of both eyes leaning out; more marked in right eye.
6	R.	Labyrinthotomy operation, recent	Ditto.
70	R.	Extirpation of vestibule, old case	Ditto.
8	R.	Labyrinthotomy, recent	Ditto.
13	L.	Superficial erosion of external semicircular canal, exposed and scraped; fistula nystagmus	Vertical meridian of left eye leaning out. Right normal.
9	L.	Labyrinthotomy performed for Ménière's disease	Vertical meridian of left eye leaning out. Normal 6 months later.
48	L.	Labyrinthitis? Nystagmus on extreme abduction to right	Left eye down.
50	R.	Labyrinthitis? Great tenderness over mastoid; old otitis media; nystagmus most marked to right	Left eye down; right eye up; very strongly marked.

involving only the tympanic cavity, and in every case ocular imbalance was present when of any severity.

In 13 of such cases a vertical imbalance was present in 8, in 4 the elevation was at fault. The explanation for this is that in those cases in which the level of the two eyes differed the mischief extended probably well into the mastoid region, and where the vertical meridians leaned out the conjugate cerebral centre was affected through the medium of the sympathetic plexus on the tympanum and its connexion with the interior of the skull through the carotid and cavernous plexus. Investigation of the effects of disease of the auditory organs on the ocular balance such as I have attempted is naturally beset with many difficulties, and presents many opportunities for falling into error. Not the least is the likelihood of an ocular imbalance existing entirely separate from any auditory affection, as we all know how common such is from our experience gained in ophthalmological work.

However, allowing for the more than probable existence of such inherent errors, I fancy we are justified in drawing the following conclusions:

The occurrence of nystagmus in labyrinthine affections proves that a relationship exists between the labyrinths and the ocular balance, that this relationship can be further logically assumed from the manner in which the conjugate centres can be expected to be influenced by the semicircular canals.

That examination of affected cases of disease of the labyrinth shows a majority of them causing an ocular disturbance in the maintenance of parallelism of the vertical meridians. That when disease tends to invade the deeper parts in the neighbourhood of the auditory organ, an ocular imbalance follows, which is manifest in a difference in the elevation of the eyes.

Time and examination of a larger number of cases may confirm or refute these conclusions, but whatever be the result, I think I have been able to show that it is a subject which is worth further investigation. If such investigation should some day enable us to obtain evidences from the eye balance of the exact nature of some of the early stages of serious ear complications, the work and time spent on it will be more than repaid.

I cannot conclude without expressing my personal thanks to the staff of the Manchester Ear Hospital, and particularly to Mr. Milligan, for their courtesy and kind permission which has been extended to me during the past twelve months, in which every facility has been afforded me in carrying out my investigation into this subject.

DISCUSSION.

Mr. Claud Worth (London) and Dr. Hill Griffith (Manchester) discussed conditions allied to those noted by the author, and Dr. C. G. Lee (Liverpool) suggested that the visual influences in the production of sea-sickness had connexion with the phenomenon noted by Mr. Bradburne.

Mr. Bradburne, in reply, pointed out the paucity of work in the past on these lines, and that what had been done referred mainly to that associated with nystagmus. He trusted that his paper showed that a field existed for further investigation, and that it was on the theory which he had enunciated regarding the relationship between the labyrinths and the conjugate centres that the phenomena of sea- and train-sickness might be explained, as had been pointed out by Dr. Hill Griffith and Dr. Charles Lee. Mr. Bradburne mentioned a case of Ménière's disease which had come under his notice in the course of his investigations into the subject. The patient was a female of over 70, who for several years had been free from any attacks, but after a severe testing of the strength of the range of movements of the obliques with a torsiometer of his own design a recrudescence of the old symptoms supervened next day. This seemed to prove the connexion which existed between the labyrinths and the conjugate centres, and probably explained the cause of several of the symptoms met with in this type of disease.

DEMONSTRATION.

Mr. Jameson Evans (Birmingham) gave a demonstration of the "optophone," an instrument devised by Mr. D'Albe, of Birmingham, which had the property of rendering light radiations audible to the ear. The instrument was a selenium photometer. The sensitive plates were set in the circuit of an electric battery, so that variations in the condition of the plate by light varied the current and caused it to work a rachet. The rate and strength of the sound indicated variations in the light, which could be appreciated by blind people. At present, he said, it was a toy, but it had possibilities.

SECTION OF LARYNGOLOGY AND RHINOLOGY.

JOHN MIDDLEMASS HUNT, M.B., President.

PRESIDENT'S INTRODUCTORY REMARKS.

AFTER some initial observations, Dr. Hunt said: In Liverpool we have now throat departments in connexion with three of our general hospitals, a lectureship in laryngology in our university, and there are seven men engaged exclusively in the practice of oto-laryngology. But much remains to be done before our speciality obtains that recognition which it has long enjoyed elsewhere. To illustrate what I mean I need only say that in this great centre of population, numbering considerably over a million, there are no beds specially set apart for the treatment of diseases of the throat and nose, except four in the Stanley Hospital, which are also used for ear cases. Personally I look forward to great changes in this respect as a result of the new Insurance Act. It is becoming evident that soon the charitable basis on which our hospitals exist will largely disappear, and that some charge will be made for the treatment of all insured persons. When this takes place I anticipate that the "insured person" will insist that while in the hospital he shall have the same skilled treatment as the wealthier classes can command in private. As a result, I expect that before many years have passed there will be no specialist connected with any of our general hospitals who will not have beds under his exclusive care for the treatment of in-patients.

But this suggests another question which is to form a subject of discussion at this meeting—namely, the training of the specialist in laryngology and otology. Several of my predecessors in this chair have devoted their introductory remarks to the education of the medical student in laryngology and otology, and great advances have been made in this direction in recent years. We can now say that there are abundant opportunities in all our medical schools for the student to learn special work—more, in fact, than he has time to take advantage of. But in the training of the specialist I do not think there has been any advance. As yet we have no system. He may, if he can afford it, spend years in acquiring a thorough scientific knowledge of his work, but more often he starts with little or no training, and has to gain his knowledge at the expense of those entrusted to his care. Of course, it must be open to any qualified medical man to practise in any department of medicine he chooses, and there must be, I suppose, the heaven-born specialist who requires no training, but I am convinced we shall never get that supply of highly-trained men which the country requires—men not only able to do all the routine work of laryngology and otology, but also to take an active part in the scientific advancement of those subjects—unless we can establish some recognized method of systematic training. How is this to be brought about? Not, I think, by our present haphazard system. Let us look abroad and see if we cannot learn anything from our neighbours. What has given to Austria, to Germany, and to other Continental nations their rich supply of highly-trained specialists? So far as I can determine it has arisen from one cause, the existence of the "Professor." He is the acme, the ideal, the man who, having mastered the whole field of ascertained knowledge in his own department, is striving to advance its borders towards the unknown. But he is only the ultimate result of a long process of competitive struggle and selection. He began somewhere as an "aspirant." He became, and remained for some years, an "assistant," progressing from a junior to a senior post. From this he may have passed at one step to a full professorship, or have gone through the stages of *privat docent* and "extraordinary professor." But through all these years he has been striving to make his scientific work of such value as to ensure his ultimately reaching this goal. Now, I do not for a moment propose that we should adopt this system. I do not think it possible even if it were desirable. We should require to begin by thoroughly disinfecting the name of professor, and removing the title from its ignoble use by the barber and the dancing master. But I think it is possible by a combination among the clinical teachers of oto-laryngology in this country to do something to improve matters, and the suggestion I would offer is the establishment of paid senior and junior assistantships in every special clinic in the country, and, if possible, the promotion of the best men from one clinic to another, for I hold that a free circulation of talent from one teaching centre to another would be of great value, both to conductors of our clinics and to the assistants under them. I would have a man begin with, let us say, Logan Turner in Edinburgh, pass on to Milligan of Manchester, and then to one of the London schools. But during these *Wanderjahre* what is he to live on? Where is his salary to come from? I think I see a way to get over this difficulty. Our education authorities will, before long, be forced to provide and pay for the treatment of the special diseases of the throat, eye, and ear so frequent in children. Why should they not make use of the existing clinics? Here, then, is one source for the payment of these assistants. Again, as I have already hinted, the Insurance Act will also bring revenue to our hospitals, part of which might also go to the same purpose. Whether after this special training we should mark off the efficient men by degrees in laryngology and otology is, to my mind, a secondary question. We shall at least ensure a satisfactory training for our specialists, which is more important than the passing of any examination, however severe.

It is impossible to work out this scheme in the short time which is permitted me in opening this Section, and there are many details which I have not thought out, but I make the suggestion in the hope that it may be considered by the teachers of laryngology and otology throughout the country, and may perhaps lead to some practical scheme for ensuring better training for the specialists in these departments, and also to a larger output of original scientific work.

DISCUSSION ON THE DIFFERENTIAL DIAGNOSIS OF OESOPHAGEAL STENOSIS.

OPENING PAPERS.

I.—Professor OTTO KAHLER,
Freiburg.

A FEW years ago the subject of differential diagnosis of oesophageal stenoses could have been disposed of in half a dozen sentences; we knew little enough of the diseases which occasion constrictions of the gullet, and troubled our heads even less about them. But since then, thanks to the introduction of two new means of investigation—the Roentgen rays and oesophogoscopy—we have got into a position to differentiate between the various diseases of the oesophageal tracts; and if there are still cases in which an exact diagnosis is unattainable, this is chiefly due to the fact that the new methods are not yet in sufficiently general use, and that far too few cases in which accurate examination by the above methods have been made, have been reported and described. It is therefore extremely gratifying that this subject should have been brought up for discussion to-day, since valuable contributions to the extension of our knowledge of this interesting field may confidently be awaited. Before entering upon the actual subject of my paper, I should like to say a few words about the various methods of examination which may be utilized for the differential diagnosis of oesophageal constrictions, and to elucidate them a little.

From the history of the case we can obtain indications as to whether a stenosis exists or not, but in most cases no information as to its nature. Slight constrictions often cause at first no noticeable inconvenience in swallowing, and yet it must ever be our aim to detect them in the initial stage, since they can then, if need arise, be treated with much greater prospects of success. In such cases we are frequently first led to suspect oesophageal trouble by the occurrence of pains which are referred by the patients to the neighbourhood of the stomach or to the back.

Direct palpation of the oesophagus being impossible (Gangolphe's[1] proposal to make all parts of the

oesophagus accessible to the finger by an incision in the stomach wide enough to admit the whole hand, and by deep oesophagotomy, is hardly likely to be adopted), the probe in its various modifications was the stock means of examining the gullet. But the diagnosis of oesophageal constriction is just one of the very cases in which the probe should not be employed. Not to mention the fact that its use is accompanied by danger—for example, in the presence of aneurysms (various cases of perforation have been recorded), it affords us no certainty of the absence of slight stenoses, they being easily passed over; neither does it give us any information as to the nature of the stenosis. A number of probe-like instruments (for example, Kelling's[2] sponge sound and Brüning's[3] fenestrated sound) have been constructed for the purpose of bringing up particles of the tumour for investigation. But these instruments are open to the same objection as the ordinary probe: there is danger of perforating a possible aneurysm. The sounding of stenoses, to ascertain the position of the constriction, is often recommended even when subsequent oesophagoscopy has been decided on. I always abstain from this preliminary investigation, as it often causes haemorrhage, and thus makes a minute inspection impossible.

The assistance of auscultation was also sought in the diagnosis of oesophageal stenoses. According to Meltzer[4] two typical sounds can be distinguished, most audible on the left side in the angle between the inferior sterno-costal margin and the xiphoid process—the so-called *stenotic murmur*, audible about six to seven seconds after the beginning of deglutition, and the so-called *pressure murmur* which conveys the impression that the whole of the liquid is passing at once and unobstructed into the stomach. Hamburger[5] auscultated the whole of the oesophagus, the cervical portion on the left side of the neck and the thoracic tract along the spine, and maintains that he can determine the absence or presence of a stenosis according as he hears the boluses glide smoothly along, or rustle and rub against one another. Quincke[6] and Ewald[7] would prefer the designations "primary" and "secondary" for the auscultation sounds. According to them, only the secondary sounds is always to be heard. Schumm,[8] who recently examined a large number of cases of oesophageal stenosis from this point of view, found in all cases, with a negligible number of exceptions, marked alterations of the deglutition sounds, mostly of the secondary sound, consisting of delay or total suppression. And finally we may mention the "residual sound," characteristic of oesophageal stenosis, described by Rewidzoff,[9] to be heard after the secondary sound if the patient is made to go through the motions of swallowing.

Percussion is rarely of any value in determining the presence of oesophageal stenosis, as it only gives a positive result in the case of large tumours.

Examination by means of Roentgen rays renders yeoman service in investigating pathological conditions of the oesophagus. We have the choice of two methods—Roentgen illumination and radiography, the illumination of the oesophagus carried out from behind and on the left, the rays being directed forwards and towards the right. The patient stands in the attitude of a fencer (Holzknecht).[10] Between the shadow of the spine and that of the heart and its appendages a bright interval appears, in which the course of the oesophagus can be made visible by introducing into the latter some substance opaque to Roentgen rays. For this purpose lead or quicksilver sounds were first used (Doyen[11]), or elastic tubes filled with shot. Still better is a method first advocated by Rumpel[12]—namely, the administration of ingesta of sufficiently high specific density to prevent the passage of the rays. A sedimentary deposit of bismuth nitrite (administered in suspension) was at first employed; but as cases of poisoning, taken to be nitrite poisoning, occurred after the use of this preparation, bismuth carbonate (Groedel[13]) is now preferred. The very latest favourite is barium sulphate, yet in the use even of this preparation two fatal cases of poisoning occurred quite recently in Prague owing to the extremely poisonous barium sulpho-carbonate being mistaken for barium sulphate by a deplorable oversight. Zirconium oxide, which is sold under the trade name of "contrastin," and is absolutely non-poisonous, is exceedingly well adapted to this purpose; but it must be admitted that it is very expensive. I should like to refer to another possible danger of this procedure in addition to the risk of poisoning. As is well known, fistulae, both congenital and acquired, occur between the oesophagus and the trachea. In such cases there is danger of the bismuthic ingesta being aspirated into the air passages. I found two reported cases (Schwarz[14] and Zimmer[15]) in which, during the examinations, the whole bronchial system in its remotest ramification was shown on the screen. In one of the cases no ill effects followed, the other terminated fatally.

The most suitable means of indicating stenoses is the administration of bismuth in capsules; for instance, to ascertain the degree of constriction at the stenoses, the patient may, according to Tornqi,[16] be made to swallow glutoid capsules of various sizes—for example, 6, 8, or 10 mm. in diameter.

But the method which has led to the greatest advances in our knowledge of the differential diagnosis of oesophageal stenoses is undoubtedly oesophagoscopy. It has, to be sure, the drawback of being the most trying one for the patient, and we should only have recourse to it when the other methods fail to give us the necessary information. All the same, with sufficient manual dexterity, especially since the improvement of the available instruments, an oesophagoscopic examination can always easily be carried out, except in the case of unusually sensitive patients.

I cannot now discuss all the various sets of instruments in general use with their advantages and defects; but beyond question the Killian-Brüning's telescopic tubes are at present those most extensively employed. Oesophagoscopy with a mandrin, formerly so frequently practised, I should like to see entirely relinquished. It is precisely in the case of stenoses of the oesophagus that the introduction of the tube without a mandrin is of incalculable importance, being the only way by which the danger of perforation can be avoided. How easily may it happen that the introduction of the oesophagoscope with a mandrin may lead to bleeding from the tumour, thus making it extremely difficult to gain a clear idea of the pathological changes that may be present. I always use a Brüning's tube without a mandrin. The best length for the guide tube is 25 cm., as this enables it to reach past the mouth of the oesophagus into the open portion before the inner tube is introduced. Opinions differ as to the best attitude for the patient during examination. For stenoses of the superior part of the oesophagus I prefer the patient to sit; for those in the inferior regions, especially if there is constriction of the cardia, make him lie on the back or on the left side, as the large quantities of mucus, evolved in consequence of the dilatation of the oesophagus which usually accompanies such stenoses, can more easily be removed when the patient is in a recumbent position.

There remains the question whether local anaesthesia or narcosis should be induced for the examination. In most cases local anaesthesia suffices; but, nevertheless, in the case of many spastic stenoses general anaesthesia is to be recommended for differential diagnosis, and in the case of children it may be said to be indispensable.

The excision of test articles made possible by oesophagoscopy is of great value for the differential diagnosis of stenoses. I have often practised this and have never observed any ill effects. Infection of the wound can easily be avoided by the application of hydrogen peroxide or tincture of iodine immediately after the operation, and the subsequent administration of formamint. If constrictions in the superior portion of the gullet are suspected, hypopharyngoscopy (Blumenfeld, v. Eicken) should always be carried out before oesophagoscopy, as we can often obtain valuable diagnostic information from the former alone.

For those who wish to diagnose a pathological stenosis of the oesophagus, familiarity with its physiological constrictions is an absolute necessity. It therefore seems to me advisable to treat these, and especially the appearances presented in the oesophagoscope, in somewhat more detail; all the more so as writers on the subject still differ on many points—for example, as to the state of things at the cardia. Mehnert,[17] to whom we owe a very accurate paper on the anatomy of the oesophagus, distinguishes thirteen physiological constrictions, corresponding to its segmental structure. Only four need be considered as of really practical importance—namely, the cricoidal, the aortal,

the bronchial, and the diaphragmatic constriction with the cardia.

The cricoidal constriction, or, as it has been termed since the appearance of Killian's[18] well-known paper, the mouth of the oesophagus, is level with the lower border of the cricoid cartilage. As seen in the oesophagoscope, it usually presents a transverse slit. When passing the constriction with the tube, the ridge termed by Killian the posterior lip of the oesophagus is usually clearly visible. In adults the mouth of the oesophagus is always closed; it is only seen to open occasionally when a deep inspiration is taken. Guisez[19] states that in children the closing is less complete; the slit gapes open during inspiration and does not wholly close during expiration. I can confirm this observation. This feeble closing of the oesophagus is no doubt a contributory cause of the relative ease with which oesophagoscopy can be carried out in the case of children. The cervical tract of the oesophagus appears in the oesophagoscope as a closed tube. A slit, usually transverse, is seen, which opens and closes with the respiratory movements. After entering the thorax the gullet is open; it is sometimes possible to see right down to the hiatus diaphragmaticus.

The next visible physiological stenosis is the aortic constriction. It can in many cases be clearly seen, and may be the narrowest point in the gullet (internal diameter 11 mm., according to Mehnert[20]). The forward projection of the aorta may be very considerable, especially in children, on account of its prevertebral position. In young people the oesophagus and aorta are in contact over a fairly extensive area. If the two organs meet at an angle, as they do in quite a number of cases, owing to slight anatomical abnormality, the constriction is still more considerable. In cachectic persons the aortic constriction is also frequently to be observed, since the physiological stenoses, as examples of arrested development, are more marked in such persons. Unmistakable pulsations can nearly always be observed by means of the oesophagoscope at this spot, especially on pressing the tube against the oesophageal wall in the left anterior quadrant. A few centimetres below the aortic constriction we see the impression made on the oesophagus by the left bronchus, but it is not always clearly marked. A further obstruction to the advance of the oesophagoscope tube is met with at the hiatus oesophageus. At this point there is often, to all appearance, a complete blockage of the passage, as in most cases the gullet alters its direction, curving forwards and to the left. There are great discrepancies between the opinions of different authorities regarding the appearance presented by the cardia. Mikulicz[21] maintains that he has never seen a sphincter-like closed termination of the oesophageal tube at the point where it enters the stomach. Hacker,[22] on the other hand, could never see directly into the stomach. Rosenheim[23] attributes these differences of opinion to differences in the way in which the examinations were conducted (the patient lying or sitting). If one neglects to take into account the alteration in the direction of the gullet, it is easy to mistake the hiatus oesophageus for the cardia, the more so as at this point a complete spastic closure of the gullet appears sometimes to exist. The cardia itself is usually closed in a rosette-like manner; but when the oesophagoscope has passed the hiatus oesophageus, the cardia can very often be seen to open and close in time with the respiration. Faulty manipulation of the oesophagoscope, causing it to be pressed against the wall of the oesophagus, may easily delude the observer into believing that he has before him a spastic closure of the gullet. The actual existence, moreover, of a means of closing the oesophagus between the cardia and the stomach follows not merely from the appearances seen in the oesophagoscope, but also from experiments on animals, such as those carried out by Magendie and Kronecker.[24] In the more detailed portion of the report my colleagues and I have so divided the subject that Dr. Brown Kelly will go into the subject of spastic stenoses and congenital constrictions, Mr. Waggett into that of diverticula and tumours, whilst I confine myself to the remaining affections of the oesophagus which may induce stenosis.

The most frequent, perhaps, of all causes leading to stenosis of the gullet is the swallowing of foreign bodies. As has already been mentioned, the anamneses do not always enable us to arrive at a diagnosis; in the case of children, for example, or of adults who swallow their false teeth in their sleep, we are left quite in the dark. Roentgen-ray examination does not always give certain information. Burger[25] has collected 220 recorded cases in which this method was employed for the detection of foreign bodies. Out of 38 cases of swallowing sets of false teeth, a positive result was attained 28 times; of 14 bones, radiography indicated 6. Only metallic foreign bodies are invariably indicated. Roentgen photographs may easily lead us astray; for example, calcificatory centres in the thyroid gland may on the plate look exactly like a foreign body in the oesophagus. I[26] have seen two such cases and Ach[27] one. To diagnose with certainty, oesophagoscopy must be employed. I once, for instance, saw a man who had been sent to the hospital as a case of carcinoma of the oesophagus. He had suffered for four weeks from increasing difficulty in swallowing, and the use of bougies had proved inefficacious. The oesophagoscope revealed a complete blockage 22 cm. from the teeth and an annular sellig of the mucous membrane. The lumen could at first not be seen. It was only after plentiful application of cocaine and adrenalin that a foreign body at length came into view and could be recognized as a false teeth plate. The extraction proved comparatively easy. I have often found that foreign bodies which have been for some time in the gullet become so concealed by granulation and swellings of the mucous membrane that their diagnosis is very difficult. In such cases anaesthetizing of the swollen parts and their reduction to an anaemic condition is of great assistance, a proceeding advocated also by Blauel.[28] A correct diagnosis can also sometimes be attained by examination with a small hook or with a probe bent up at a right angle at the end, the instrument being watched through the oesophagoscope. We are thus enabled to feel under the swollen folds of the mucous membrane and so find any foreign body that may be present. Except on one occasion I have always been able to recognize a foreign body as the cause of the stenosis at the first examination. In that case a coin had been jammed in the gullet for a week, and was completely covered by mucous membrane. No Roentgen apparatus was available, and neither the use of cocaine and adrenalin nor even the general anaesthetising of the patient brought it into view. I then ordered the sucking of ice, and the next day the coin could be seen quite easily. In differentiating between a tumour and a foreign body the violent pain felt when the spot under which the foreign body lies is touched may be turned to account. Poli[29] has drawn attention to a diagnostic sign which he maintains to be characteristic of foreign bodies in the oesophagus; he found in a number of cases a rounded inward bulging of the posterior wall of the trachea. It may, however, be assumed that this symptom is only perceptible when the foreign body is lodged sagittally. The swallowing of foreign bodies, even if they do not remain lodged in the gullet, leads by no means infrequently to pathological changes which result in the formation of stenoses. We often find that subjective stenoses have had their origin in injuries caused by foreign bodies—small scratches—most frequently at the mouth of the oesophagus, which not seldom lead to a secondary spasm. Such stenoses can only be diagnosed by means of oesophagoscopy. If such a spasm is observed, it is often possible, after applying cocaine, to see the still slightly bleeding abrasion, or, in the case of rather large bodies that have wedged themselves transversely or sagittally across the gullet, injuries on both sides. Quite frequently lesions caused by foreign bodies occasion perioesophageal purulent processes—abscesses, which may result in almost complete blocking of the gullet. I have had opportunity of observing four cases of this kind. Such cases have also been reported by Guisez,[30] Halsted,[31] and others. The appearance presented in the oesophagoscope is very typical; the abscesses appear only to occur in the cervical portion of the oesophagus, for the simple reason that it is only here that the greater number of foreign bodies cause injuries. We see a highly reddened smooth swelling often displaying at some point of its surface an ulcerated, greasy-looking spot—the lesion caused by the foreign body—from which pressure with the tube causes pus to exude. On feeling it with the tube, or with a probe, fluctuation is easily perceived, and

this should be employed as a differential diagnostic indication of the absence of malignant tumour. On incision a quantity of pus is evacuated. In three cases of the kind incision led to a complete cure; a fourth case ended fatally, in spite of external oesophagotomy, in consequence of progressive mediastinitis. It would be interesting, if time allowed, to discuss the question when external oesophagotomy is indicated in such cases, and when internal lancing is insufficient. My own opinion is that, if there is an increase of fever, however slight, and severe pain, it is absolutely necessary to perform the external operation, in order to avoid the danger of the inflammation extending in the direction of the mediastinum.

Cicatricial formations in the gullet, which may arise from the most varied causes, lead very frequently to stenoses. The commonest of these causes are lesions caused by drinking caustic liquids either by mistake or with suicidal intent. Generally speaking, of course, the patient's own statements make diagnosis easy and certain; yet in cases of attempted suicide they are often mendacious; and, in addition, it frequently happens that pronounced constriction does not set in till many years after the injury, when the patients have very likely completely forgotten the occurrence. We must therefore base our diagnoses solely upon the observed facts—a procedure that may not seldom be of great importance from a forensic point of view (Guisez). Roentgen skiagraphy enables us, no doubt, to determine the position and length of a cicatricial stenosis, but we cannot by this method distinguish it from other—for example, malignant—stenoses. The oesophagoscope clears up the question. The appearances differ according as the injury is recent or occurred some time back. In the case of recent lesions we find great swelling and reddening of the mucous membrane, generally accompanied by spasmodic contractions of the oesophageal walls. The appearance presented resembles that of the closed os uteri. In the immediate neighbourhood ulcerations are to be seen covered with small reddish granulations, as also whitey furred patches.

Granulations are also sometimes still to been in the case of stenoses of fairly long standing if the bougie has been previously employed. If the granulation is extensive carcinoma can often only be diagnostically excluded by the excision of fragments for examination. Scars caused by injuries are of extremely varied configuration. We rarely have to go further than the mouth of the oesophagus to find them, most frequently on the posterior wall, in the form of sharply projecting, whitish, lustrous ridges. In the case of strictures due to caustic liquids, scars are generally to be found at the other physiological constrictions also—a fact which should be utilized to differentiate them from scars due to other causes. Hacker,[32] in a passage which has become classic, describes the oesophagoscopic appearance of strictures due to physical or chemical lesions as follows: We see streak-like, longitudinal scars, flecked with white, which stand out conspicuously against the pink mucous membrane. If the scars are completely clothed with epithelium, they are smooth and lustrous, usually thin and, if anything, rather depressed below than rising above the surface of the mucous membrane and only in places projecting like cords. The more nearly we approach the seat of the stricture the more extensively is the mucous membrane converted into cicatricial tissue. An annular, or the mouth of a cylindical, stricture looks rather like a more or less scarred funnel, down at the small end of which a roundish or oval lumen can be seen, or, to use another simile, like the portio vaginalis. This is due to the fact that the part of the oesophagus above it is dilated and is pushed down, *pari passu* with the tube, over the stricture, which it invaginates itself into like a faucet. Respiratory movements and radial creasings are usually absent. The deeper the lesion was the more marked and the more rigid is the stenosis. All works on the subject contain passages similar to this classical description of Hacker's, with which also my own observations are in complete agreement. In the case of injuries caused by caustic alkalis, the residual lumen of the oesophagus may assume the most various positions; it is, perhaps, most frequently eccentric. Stark[33] attributes this to the fact that cases in which it is central are easily probed, and that consequently the oesophagoscope is probably more rarely resorted to. Scarred stenoses may, however, be also due to other causes.

Injuries occasioned by foreign bodies seldom lead to such morbid changes. Guisez[34] reports 2 cases of this kind in which the symptoms of stricture did not appear until six and ten years respectively after the swallowing of the foreign body. Such scars are, according to Guisez, easy to diagnose. The characteristics are their isolated occurrence, the shortness of the scars, which are frequently linear, and the complete mobility and freedom from all ill effects of the rest of the mucous membrane.

The same author describes 5 cases of scar stenosis at the cardia, which he designates as spontaneous scar stenoses. The appearances were in every case the same—a central lumen, annular sclerosis of the mucous membrane, which was white and scarred. Since the history of the case excluded every other etiology, he attributed the changes to chronic oesophagitis. He supposes the primary cause to be spasms of the cardia. The irritation caused by the accumulation of the food thus obstructed led, he thinks, to sclerosis of the mucous membrane and to the other observed results. That catarrhal ulcers of the kind described by Gottstein,[35] Rosenheim,[36] and others can result in the formation of cicatrices, I am able myself to confirm. I once saw a case of this kind in which the existence of an ulcer 1 cm. long in the hiatus diaphragmaticus was ascertained. Some month later I observed in the same patient on the site of the ulcer a white scar which somewhat reduced the area of the lumen. The occurrence of sears of this kind is probably in most cases to be attributed to burns caused by too hot food. At any rate, he statements of my patient led to this conclusion. Gtottstein[37] also reports a case of this kind.

Scar stenoses can also be produced by a peptic ulcer, the so-called ulcus simplex. These scars will always be found, in correspondence with the position of the ulcers, at the cardia, or, at all events, in the inferior portion of the oesophagus. In the patient's account of his symptoms, phenomena which point to ulcus ventriculi—for example, severe pain, especially in the back, and the vomiting of blood—should be given weight. The disease is in any case rare. Wilder Fileston[38] has succeeded in collecting 41 reported cases. Oesophagoscopic observations have only been made by Guisez,[39] Mikulicz,[40] Gottstein,[41] and v. Hacker.[42] A differential diagnosis excluding catarrhal ulcers must be principally based upon the answers of the patient; peptic ulcers differ also in being larger and penetrating deeper. In the case of carcinomatous ulcerations the respiratory movement of the wall, which in the other diseases usually persists, is no longer found. It is not so very rare to find scar stenoses after acute chronic infectious diseases in which the oesophagus has been affected. Such cases after scarlet fever have been most recently reported by Oppikofer.[43] In 128 *post-mortem* examinations of scarlet fever subjects, he found that in 15 cases the oesophagus had been attacked. This is usually accompanied by typical changes in the larynx—a circumstance which facilitates diagnosis. Amongst Oppikofer's cases, there were only 3 in which the oesophagus alone was affected. Scars have also been already observed after oesophageal diphtheria (Jungnickel,[44] Killian,[45] Field[46]). Oesophageal strictures following typhoid have not yet been observed through the oesophagoscope; we have only reports based on *post-mortem* examinations. Tamerl's[47] observation of pemphigus of the oesophagus stands alone. In such cases the diagnosis is checked by the appearances on the other mucous membranes.

In the case of the chronic infectious diseases, lues and tuberculosis, constrictions of the gullet have been many times observed. They also can, as a rule, only be diagnosed by means of the oesophagoscope. In lues, gummatous infiltrations, and the secondary cicatricial contraction following on their disintegration, are the causes of the constrictions. Oesophagoscopic observations of tertiary lues of the oesophagus have been reported by von Hacker,[48] Gottstein,[49] Fackelday,[50] Mersbach,[51] Guisez,[52] and Jackson.[53] I have myself seen a case in which it was possible to diagnose lues from the appearances observed with the oesophagoscope. In the cervical portion of the oesophagus, covering the

right oesophageal wall, was a dull red infiltration, in which was a quite sharply defined ulcer, with a yellowish-white coating. The appearance of these pathological features, the small amount of pain, and the statements of the patient as to lues, led me to diagnose gumma. That this was correct was shown by the success of the specific treatment. The case reported by Gottstein presented equally typical pathological features, but such typical appearances will not be found in all cases. In the differential diagnosis of non-ulcerated gummata it is no doubt difficult to distinguish between compression by a gland or a tumour; in case of need we must have recourse to the Wassermann reaction. It is also not always easy to distinguish between lues and tuberculosis. This was shown by the very first case of tuberculosis of the gullet that was ever observed oesophagoscopically (von Schrötter[54]), it being taken for syphilis; 32 cm. from the upper alveolar process the mucous membrane was swollen and tumour-like, the lumen was about 3 mm. in diameter. On account of the simultaneous existence of scarring, lues was diagnosed. In a second case Schrötter saw on the anterior wall, 20 cm. from the dental line, a coarsely tuberculated tumour which, on advancing the tube, showed mobility. The colour of the infiltration was strikingly pale. The examination of excised test fragments showed the correctness of the diagnosis of tuberculosis that he had already been led to by the appearance of the tumour. The pale colour of the infiltration and the appearance presented by the ulcers should be made use of for differential diagnosis. Guisez,[55] who has been able to examine 6 cases oesophagoscopically, has had more experience than any one else of oesophageal tuberculosis. He distinguishes three forms: (1) The secondary oesophageal tuberculosis, arising from perforation by tuberculous glands. In this form the symptoms of compression of the air passages are present; there is a tumour-like rounded projection, mostly lateral, and the lumen is crescent-shaped. The seat of this contraction is in the neighbourhood of the bronchial bifurcation; Guisez advises recourse to tracheoscopy in case of need. It is possible, if no better way is open, to infer disease of the bronchial glands from the enlargement of the spire of the bifurcation.

The second form, the ulcerous, is probably the most frequent. Since these ulcerations of the oesophagus arise at a comparatively late stage, and the patient is then already so weak that oesophagoscopy appears to be contra-indicated, they will probably rarely be observed. The appearance of the ulcers hitherto observed was thoroughly characteristic. There were granulations in the neighbourhood, and the ulcerations were very painful. In many cases these characteristic nodules would probably have also been visible in the neighbourhood of the ulcers on careful inspection.

The third form, tumorous types of oesophagal tuberculosis (Schrötter's type), is, in any case, very rare. It can probably only be diagnosed with certainty by examination of excised test fragments.

Strictures of the oesophagus due to actinomycosis have been reported on by Gottstein,[56] Weylowski,[57] and Netter.[58] A diagnosis of these rare strictures can only be attained by bacteriological examination of specimens obtained by aid of the oesophagoscope.

In conclusion, we have to mention compression stenoses. The rounded protuberance, usually lateral, the smooth and normally coloured mucous membrane with which the protuberance is usually covered, and the crescent-shaped lumen are characteristic. If the narrowing of the passage due to the compression is considerable and has been in existence for some time, the oesophagus is dilated above the seat of the stricture, as it is, in fact, in all well-marked cases of chronic stenosis. This can easily be demonstrated, either by means of Roentgen rays or with the oesophagoscope.

In the cervical section of the gullet compressions may be caused by goitres. Their diagnosis is easy, as the goitre can be perceived by external palpation. Such cases have been observed by Goyanes,[59] Bennett May,[60] v. Hacker,[61] and Gottstein.[62] In the cervical section, compressions due to lordosis of the cervical vertebrae are not infrequent. Von Hacker[63] observed the first recorded case of this kind with the oesophagoscope. The lumen was slit-shaped, being pressed forward by prominence of the hardness of bone, which projected from the posterior wall. Oesophageal stenosis may also be produced by ecchondroses of the upper dorsal vertebrae (Zahn[64]). There should be little difficulty in diagnosing such cases by means of Roentgen photography. According to the investigations of Hacker and Köllicher, no compression or distortion of the oesophagus is caused by scoliosis of the vertebral column. A compression of the gullet by a tuberculous abscess at the back of the pharynx is also always easy to diagnose, as fluctuation can be perceived, and destruction of the bodies of the vertebrae can be seen if Roentgen rays be employed. I have already mentioned that compressions of the gullet may be brought about by tuberculous glands. The first case of the kind was described by Zencker.[65] Since then many have written on the subject; for instance, Grabower,[66] Buss,[67] Pèhu,[68] and others. It is usually possible to diagnose with certainty on the ground of the Roentgen plate, taking into account the characteristic position of the stricture in the neighbourhood of the tracheal bifurcation. Sendziak[69] was able to diagnose a case as compression of the oesophagus due to carcinomatous glands by the help of Roentgen photographs, confirmed by the discovery of a double paralysis of the posticus muscle of the larynx. Malignant tumours of the mediastinal glands often cause at first only a smooth lateral or anterior protuberance in the gullet on which the mucous membrane is completely normal. It is only later, when the mucous membrane has become adherent, that the appearance of the swelling becomes more nodular. In the attainment of a correct diagnosis the help of the tracheoscope can be resorted to. In three cases inspection of the interior of the respiratory passages enabled me to see the tumour, which had already eaten its way through the rear wall of the trachea, but in the oesophagus had as yet only produced a simple protuberance. The observations made by Störk and Kovacs[70] of stenoses of the oesophagus due to enlargement of the heart are deserving of great attention. The pressure of the enlarged heart, and especially of the dilated left auricle, upon the oesophagus, produces displacement and compression, especially in the section between the bifurcation of the trachea and the point where the aorta crosses the oesophagus. I have observed such a case through the oesophagoscope. The patient had little difficulty in swallowing. The anterior wall of the gullet was seen to bulge inwards 25 cm. from the dental line, and very pronounced pulsation was visible. It is not possible to diagnose such cases by oesophagoscopy alone, as the appearances do not differ from those seen in the frequently occurring cases of compression of the gullet by aneurysms. The latter very common stenosis presents a characteristic appearance. A hemispherical protuberance, usually of the left and anterior walls, is visible in the thoracic section of the gullet, and the lumen is displaced by it backwards and to the right and compressed to a crescent. Pulsation is always clearly visible. I have examined seven cases of this kind, in which the correctness of my diagnosis was demonstrated by skiagraphy and the subsequent necropsy. Guisez[71] also observed six oesophageal stenoses due to dilatation of the aorta and four due to aneurysm, and very rightly emphasizes the fact that in oesophagoscopy we have at our disposal a means of recognizing such pathological changes in their initial stages. It is not always entirely easy to distinguish between mediastinal tumours and aneurysms, since the latter, shortly before bursting, cause also a somewhat tuberculated protuberance. The pulsation is, however, never so marked in the mediastinal tumours.

In the lower section of the oesophagus, compression stenoses are very rare. Gottstein's[72] case, in which stricture was due to a calcareous plate in the pleura, and Collier's[73] case of stenosis caused by cancer of the liver, must well be unique.

The new methods of examination, by the use of Roentgen rays and of the oesophagoscope have very greatly increased, our diagnostic power. But for the recognition of the oesophageal stenoses the maxim is especially of force, that we must not cling exclusively to one method of examination, and that our goal is often only to be reached by calling in the assistance of all known methods. Most important of all, we must always remember that, as Semon[74] has so well said, "the human body does not consist of a number of strictly separated parts." We must always consider the patient as a whole, and then we shall be responsible for no false diagnoses.

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II.—E. B. WAGGETT,
Surgeon, Nose, Throat, and Ear Departments, Charing Cross Hospital.

MALIGNANT DISEASE AND POUCHES IN THE OESOPHAGUS.

I THINK that if this meeting of experts disperses to-day without formulating a definite guide to the diagnosis of malignant stricture, it will not have done its duty—for after all, much as we all dislike the subject, we have to remember that at least three out of four gullet cases are malignant.

A case of dysphagia with regurgitation of alkaline food, emaciation, pain, recurrent and sympathetic nerve paralysis, will probably turn out to be one of malignant disease, but we cannot for a moment make a definite diagnosis on these symptoms. I do not think that we should spend our time this morning profitably in the discussion of symptoms which are quite indecisive and merely indicate oesophageal stenosis, which may be due to inflammatory trouble or to mediastinal tumour of one kind or another. Even the enlargement of supraclavicular lymphatic glands, coupled with oesophageal obstruction, does not decide the diagnosis. The one certain diagnostic sign, namely, the spontaneous ejection of a piece of growth, the nature of which can be proved by microscopic examination, is an occurrence of which I have knowledge neither at first nor second hand, though I have seen it quoted in general terms in some of the books. I need not say here that the admixture of blood with regurgitated food is by no means diagnostic of cancer, for the blood may come from dilated veins or from fissures and ulcers which are non-malignant.

I am surprised to find that the general textbooks still affirm that the sovereign means of diagnosis lies in the passage of the bougie, and some of them rather naïvely suggest that the bougie on withdrawal should be examined for blood, the presence of which will afford evidence of malignancy. There is some wisdom in this suggestion, for a blood-stained bougie certainly affords evidence that the course of the case is not likely to be happy if the bougieing is frequently repeated. It is true that in the hands of certain surgeons the blind passage of bougies, coupled with great manipulative skill, long experience and the clinical instinct, has given reliable results with but few errors and accidents; but this blind method of diagnostic palpation has now to compete with methods of recent development, and in order to compare the old methods with the new, we might with propriety bring forward to-day statistics of serious accidents resulting from the blind passage of the bougie. Any reliable statistics of the kind, however, would be impossible to come by, and I say this because I have personally heard of a good many fatal cases, none of which, so far as I know, have ever been recorded. I am anxious that we should at this meeting to-day once and for all throw cold water upon blind bougieing of the gullet, for the reason that it is both unsafe and quite inconclusive.

We now have two diagnostic methods, both of which can be used with safety, and one of them with certainty; I refer, of course, to the *x* rays and the direct method.

With the *x* rays we cannot diagnose malignant disease of the oesophagus, but, on the other hand, we can with perfect safety diagnose stenosis of the gullet and locate the position of the stenosis, determining at the same time whether the cause is intrinsic or extrinsic—that is to say, due to stricture in the true sense or to compression by neighbouring structures.

A good deal of information as to the mediastinal contents is forthcoming from a simple *x*-ray photograph, but with the addition of bismuth porridge and the right antero-lateral posture, very precise information is to be obtained. With a powerful source of *x* rays and a small diaphragm in use, we can observe the process of deglutition in the fluorescent screen with no difficulty. I should like to say here that the ability of the observer to watch the descent of the bismuth meal depends very largely upon the length of time he has rested his retinae. Certainly in my own case a rest of ten minutes in complete darkness enables me to see a very great deal more than does a rest of three or four minutes, and I have read somewhere that a rest of thirty minutes increases the visual acuity fifty times—a point worth considering when we have to make the best of apparatus which is not of the latest pattern.

Under favourable circumstances it is then possible to make out the position of an obstruction, the degree and length of the stricture, and the character of the dilatation above it; we cannot, however, for a moment claim that the nature of the stricture can be detected by *x* rays. It might, for example, be supposed that a narrow tortuous stricture, as shown by the bismuth porridge, either on the screen or in the photograph, was highly suggestive of malignancy, but Dr. Hill tells me that he has a case of long tortuous stenosis which is definitely cicatricial.

Direct oesophagoscopy enables us to make absolutely sure of our case and to make a genuine diagnosis. We should, I think, all admit that the direct method of examination with the oesophagoscope was perfect and ideal if it could be made without danger and without discomfort. Let us, then, try to make a just estimate of the shortcomings of the direct method.

First, with regard to danger: I make bold to say that the inspection of a stricture, malignant or otherwise, can always be made without danger, or at least with no more danger than that entailed by the local or general anaesthetic employed. I know well that in skilful hands a certain number of fatal accidents have occurred, but it is our special business to point out that these are avoidable accidents, and, indeed, should always be avoided. I

believe I am right in saying that in all cases they have been due to one of two causes—namely, the laceration and even penetration of the diseased tissues by a guide or mandrin projecting in front of the oesophagoscopic tube, or else the attempt to pass the tube into and past the stricture.

Taking the second point first, I would like to suggest that for purposes of diagnosis it is never necessary to do more than bring the end of the tube into proximity with the stricture, and I think that in the majority of cases it is quite unnecessary to go nearer to the stricture than half an inch; from this distance one can with precision and safety wipe the diseased part with cotton-swabs and remove a fragment with the forceps. Where this has been done I have never seen even temporary ill effects. In a word, I consider that for diagnostic purposes we should be content to see the upper edge of the diseased area in a field clear of saliva and food, and if the appearance is not decisive as to the nature of the disease, to remove a small fragment with delicacy and precision.

Secondly, with regard to the mandrin. We all know that the passage of the cricoid constriction is facilitated by its use, and it is conceivable that when the *x* ray has made it abundantly clear that the upper region of the oesophagus is in a particular case quite sound, the use of the mandrin may be permissible. Certainly the mandrin should be withdrawn as soon as the cricoid region is passed, for I am certain we should make it a definite rule that no suspicious area ought to be approached except under the direct guidance of vision. For my own part, I never make use of a mandrin until I have learnt by previous direct examination under visual control that the upper end of the gullet is perfectly sound, and I do not see any reason why this should not be adopted as a general rule. No one can say that the mandrin is a necessity, and I cannot recall a single case of healthy cricoid constriction which could not be traversed without its assistance, that is to say, since we have had bevel-ended spatulae, such as those of Brüning; and we have had them now for a good many years. All, I think, will agree that it should be taken as an axiom that where the upper end of the gullet is diseased the use of the mandrin entails a risk to which we have no right to subject our patients. I would also repeat here that we need for diagnostic purposes to see only the upper limit of the disease, and that we have no right to do more than look at and deal with the upper edge of the lesion. If this be a sound view to take, there can be no further excuse for the use of the mandrin, and I hope to hear this meeting affirm its belief that the mandrin should never be used except in those regions of the gullet which are definitely known to be healthy. The use of bougies passed under visual control is, of course, a totally different matter.

It is a good plan to imagine yourself as the patient, as I have had occasion to do, and ask yourself if you will allow even the most expert of your friends to approach a dangerous lesion in your own gullet with any instrument except under direct visual control, assisted by careful swabbing or pumping. I venture to say that we should all prefer for use on our own persons the old-fashioned flexible blind bougie to the modern rigid blind mandrin.

I think we shall do a valuable piece of work if this meeting formulates a rule for the guidance of the inexpert, to the effect that no rigid instrument ought to be passed down the oesophagus except under direct visual control.

Next as to the comfort of the patient. No one can pretend that oesophagoscopy is pleasant to the patient, though all of us who have any experience have come across certain patients, sometimes hysterics, who seem rather to enjoy the process. I have very rarely seen the patient complain of genuine pain once the cricoid constriction is passed, and though a good many complain of the sense of pressure against the cricoid cartilage when a large tube is used, this is not a serious matter, and is less distressing than the pain caused by pressure on the teeth, and far less important that the psychological element. I have the impression that the sense of fear and of insecurity is much diminished by employing the recumbent position, either dorsal or right lateral. This, of course, is not the place to go into small details of technique, and I wish merely to say that the discomfort of the passage of the tubes is really very slight if the right lateral position is adopted, if the examination is preceded by a dose of morphine and atropine, and if the mental distress is eliminated by the knowledge that the surgeon will keep his compact honourably to withdraw the instrument when a preconcerted sign is made by the patient. I said the passage of the tube was not distressing; it is another matter with regard to the retention of it, for in a very short time the pain from pressure on the teeth, and also the general sense of distress, become literally intolerable. It is for this reason, and not on account of the difficulty of passage, that a general anaesthetic becomes necessary when a preliminary examination under cocaine has shown the patient to be intolerant.

Let us frankly admit that oesophagoscopy is not a pleasant process, and also that a hurried examination made under cocaine is often quite useless—indeed, should be regarded as worthless where merely a negative and no positive result is forthcoming. If in any such case the diagnosis is worth making, it is worth while to give a general anaesthetic. With a light chloroform anaesthesia there is no danger and no after-discomfort. I would add that it is wise to keep the patient under observation for twenty-four hours.

With regard to difficulty, I have unconsciously divided my own cases into two classes: the easy class, where the disease is definitely in the middle and lower portions of the gullet, and the difficult class, where it is suspected at or about the cricoid constriction. An essential point in the second class is to make out quite clearly the condition of the cricoid constriction as the instrument traverses it. This is not always easy to do, but it can be done if two hands are taken to the work—the left hand to supply the forcible traction upon the cricoid, and the right hand to advance the spatula slowly and delicately; during its gradual progress the spatula should be rotated on its longitudinal axis by means of the left hand, so that all parts are brought into view.

I strongly deprecate the manœuvre recommended by some surgeons whereby the tip of the instrument is felt suddenly to pop through the cricoid constriction. It is, of course, easy enough to perform this *tour de maître*, but it leaves the surgeon in almost complete ignorance of the condition of the part he has traversed, and I confess myself to have passed by a dangerous foreign body impacted in the cricoid region, and to have discovered it only on withdrawal of the tube. This is bad surgery, and cannot but lead to occasional accidents. The expert may consider that he can afford to be responsible for a few accidents, but the time has now come when oesophagoscopy should be placed in the hands of at least one man in every cottage hospital; and I hope that you will support me in urging the necessity of this gradual sliding of the instrument through the cricoid constriction under constant and real visual control. It is not difficult if two hands are used. It is not difficult—that is to say, for the surgeon, but it may be extremely difficult for the patient to tolerate, and I think we may say that the question of employing local or general anaesthesia is one which depends almost entirely upon the psychology of the patient. Records of Killian's clinic show that nearly all adult cases are examined under local anaesthesia; Mosher in America, on the other hand, considers that general anaesthesia is necessary in almost every case. In Germany the surgeon deals with a populace trained to confide in the word of authority; in America that mental training is absent. In this country we certainly find that women are more amenable than men to manipulation under local anaesthesia; they are more ready to repose confidence in the surgeon.

Oesophagoscopy, the certain method of diagnosis, may be said to be free from danger if the surgeon will learn and practise the technique, and not attempt to do more than is necessary. It is often extremely irksome to the patient, but this difficulty can always be overcome by general anaesthesia. One question remains: Is it always possible? The cases in which it is impossible, granted a general anaesthesia, must, I believe, be very limited in number. Personally I have seen but two cases, one of ankylosis of the cervical and dorsal vertebrae in an old man, another of partial ankylosis of the jaw coupled with a good set of teeth. Both occurred some years ago, at the time when we were content to arrive at a diagnosis by the weighing of probabilities; and I do not remember testing them by von Eiken's method of hypopharyngoscopy, which in the case of the old man would very likely have

revealed the post-cricoid carcinoma which subsequently made itself evident. This method is very ingenious and should give excellent results if properly carried out; but, if I may judge from my own experience, it is much more difficult to perform with success than is the direct method. The vigorous traction of the probe with one hand renders the manipulation of the mirror with the other somewhat difficult. Killian's suspension laryngoscope promises a more satisfactory method of obtaining a general view of the post-cricoid region. I have been in possession of the instrument but a few days, and am therefore unwilling to say much about it.

Year by year the technique advances; we have excellent new tubes devised by Hill in this country and other experts abroad—we have, this year, Killian's suspension apparatus, and we have general anaesthesia by intravenous infusion of ether—an element in the technique which I suspect we have all used with great satisfaction. Any diagnostic formula, therefore, which we can devise to-day will doubtless be superseded by something better in the course of a year or so, but I hope you will all agree that the time has come when every laryngologist should be capable of oesophagoscopic diagnosis, and that some definite guide should be forthcoming. It is certain that many a competent surgeon has not yet made the plunge, owing to the supposed dangers, difficulties, and uncertainties of the method; can we not supply him with a guide to be followed with confidence and success?

For your criticism I would put it in this way: In a case of dysphagia, at the first visit a surgeon should take the history and symptoms, palpate the neck, percuss and auscultate the chest, examine for aneurysm, examine the larynx, the trachea, and the pupils, and in a tolerant patient perform hypopharyngoscopy. He should strictly avoid the blind passage of the bougie.

At a second sitting he should examine by *x* rays with screen and photographic plate, both with and without a bismuth meal. As a rule, this will determine the condition of the aorta and of the mediastinum, and will indicate the position of the upper end of the diseased area, and also exclude hypopharyngeal pouch.

At a third sitting the oesophagoscope should be passed under cocaine anaesthesia, either in the sitting or recumbent posture, as preferred by the patient. The tube, and preferably Brüning's telescopic tube, should be passed under direct visual control, that is to say, without any mandrin. The tube should merely approach the diseased area and not be passed through it. A fragment should be taken for the microscope if necessary. If the patient prove unable, in spite of scopolamine, morphine and cocaine, to tolerate a slow, deliberate examination, a negative result must be taken as worthless, and a general anaesthetic, chloroform or intravenous ether, should be given, and the tube passed without mandrin and without passing the extreme upper limit of the diseased area.

Practically it comes to this: Get general indications with the *x* ray, then pass the oesophagoscope under visual control. To the expert this may seem unnecessary talk, but I am certain it is necessary if the direct method is to take its proper place in this country.

The diagnosis of pouches falls to my lot, but I do not intend to say much upon this topic, for the reason that the subject is very adequately dealt with in the textbooks, but chiefly because I am anxious that we should not allow ourselves this morning to shirk the discussion of the less interesting subject I have just dealt with.

True oesophageal pouches are practically always traction-pouches, the result of cicatrization of diseased bronchial glands. Consequently they are generally found just below the level of the bifurcation of the trachea and on the anterior aspect of the gullet. As a rule, they have a wide opening and a pointed fundus, and as the latter is nearly always on a higher level than the former, food does not tend to collect in and to distend the cavity. Consequently these pouches do not give rise to symptoms, and are usually discovered accidentally. One may say that the diagnosis is made by the oesophagoscope. I have found one or two references to true pulsion-pouches situated at the lower end of the oesophagus, but I have never seen a true oesophageal pouch *intra vitam*.

We must, however, consider the pharyngeal pulsion-pouch, for though it is in fact a herniation of the lower pharynx and not of the oesophagus, it comes into notice by obstructing the latter viscus. I think we are all familiar, through the writings of Butlin in particular, with the anatomy and surgery of these pharyngeal diverticula. The diagnosis is fairly easy, and it is usually made by the patient, who, as his meal progresses, experiences increasing difficulty in deglutition associated with the development of a swelling in the neck immediately below the level of the cricoid, and usual upon the left side. I have one case where the pouch projects to the right, and I should be interested to learn if any one present has a similar experience.

The patient learns that by manipulation he can partially empty the pouch and continue his meal; I have one patient who cannot manage this manœuvre, and, as she refuses operation, has to content herself by washing out the pouch with a syringe two or three times during dinner.

These patients often complain of the rejection of unaltered food some hours after its ingestion; it comes up in small quantities at a time, unlike the gush of regurgitation or oesophageal vomiting observed in cases of true dilatation, such as occurs above an organic stricture. Unless the pouch is kept clean by syringing after meals, fermentation takes place, with the production of foam which may cause great discomfort, and incessant cough at night. I do not remember observing this particular symptom in any but pouch cases. In conjunction with the symptoms mentioned, the *x* ray with bismuth porridge gives invaluable evidence, but I believe that we cannot always, by the mere inspection of the photograph, assert that the case is one of pouch.

An ingenious diagnostic method has been devised by Plummer. About six yards of silk are swallowed during the twelve hours preceding the examination. A bougie, with its perforated acorn-head threaded over this silk, is passed down to the obstruction in the gullet. The silk, its lower end more or less anchored in the intestines, is now pulled taut. If the bougie remains unmoved, you may diagnose stricture, but if it is raised, say a couple of inches, you may conclude that you are dealing with a pouch, and that the distance between its fundus and the lower lip of its orifice is two inches. I think it should always be possible to diagnose a pouch by the direct method if the tube is passed under visual control and quite slowly. The difficulty is, of course, to see the horizontal slit-like orifice of the oesophagus, which lies immediately below the level of the cricoid and sometimes under cover of the lower edge of that cartilage. The spatula passes only too readily into the pouch, and it is easy to miss the oesophageal opening unless either the introduction or the withdrawal is made with great deliberation and with the additional aid of a probe. Mosher describes the detection of the oesophageal opening in an elusive case of this sort by the use of a pneumatic oesophagoscope, whereby he obtained a view of the inflated viscus and saw the two orifices as he withdrew his instrument.

However, it must be but very seldom that the diagnosis of pouch cannot be made by the exercise of patience and a little ingenuity, and I will say no more about it; and I will conclude by respectfully urging upon you, Mr. President, the desirability of arriving this morning at some consensus of opinion as to what is safe and what is clinically sound in the diagnostic methods for oesophageal cases. If we can agree upon a routine method of examination for general use in the daily run of cases, and put it forward as a recommendation to those who do not profess to be expert in the matter, we shall, I believe, have done a day's work of some value.

III.—A. Brown Kelly, M.D., D.Sc.,
Surgeon for Diseases of the Throat and Nose, Victoria Infirmary, Glasgow.

STENOSES AT THE LOWER END OF THE OESOPHAGUS, WITH SPECIAL REFERENCE TO THOSE OF SPASTIC ORIGIN.

When a meeting of laryngologists proceeds to discuss affections of a region so distant from their own domain as the cardia, some explanation may seem called for. A little consideration, however, should show that they are not seeking to annex territory already administered by others, but are merely fulfilling their destiny as endoscopists. An apology for apparent trespass is certainly not due to the physicians. With a few brilliant exceptions, they have

neglected to avail themselves of the most valuable aid in the diagnosis and treatment of affections of the cardia—namely, direct inspection. The study of these conditions, therefore, need not be denied the laryngologists, whose training qualifies them to make the examinations and the majority of whom at the present day are furnished with the necessary armamentarium.

Disease at the cardia first received attention in the *post-mortem* room. Then came a period in which the bougie, auscultation of deglutition sounds, chemical and various physical tests were employed. Ingenious as these were, little clinical progress was made until oesophagoscopy began to be practised by a few surgeons and physicians. Radiology, at a much later date, helped greatly towards the explanation of the processes of deglutition, and continues to afford valuable assistance in many doubtful cases.

Cardia and Epicardia.

As some confusion exists as to what precisely is meant by the term "cardia," a few words on the subject may be opportune.

Anatomically the cardia is the junction of the oesophagus and stomach, and is indicated by an irregular line demarcating the pinkish lining membrane of the former from the dark red velvety mucosa of the latter. The regions above and below this line are known respectively as the cardiac portion of the oesophagus and the cardiac portion of the stomach. From the hiatus oesophageus to the cardia is a distance of about 5 cm.; this has been termed the epicardia, and is made up of the diaphragmatic and abdominal portions of the oesophagus. It is more than doubtful whether certain functions and disorders attributed to the cardia have not their seat in the epicardia; it might therefore be best to refer to this region as the epicardia-cardia. For the same reason we should remember that the term "cardiospasm" does not fully represent the extent of this affection; on other grounds it is objectionable, but our knowledge of the physiology and pathology of this affection does not yet justify a change in nomenclature.

Symptoms.

The symptoms of obstruction at the cardiac end of the gullet are: (1) Hindrance to the passage of solids and liquids into the stomach; all degrees may exist, from the slight or momentary difficulty with meat to complete obstruction to the passage of liquids. The patient may be able to force the contents of the gullet into the stomach by swallowing movements or by drinking large quantities of fluid. (2) Discomfort or pain in the epigastric region, which the patient attributes to food and drink lying in the gullet above the stomach. The pain may radiate to the back, shoulders, or arms. (3) Vomiting, or rather regurgitation, which takes place readily, often without effort, immediately after a meal or while fasting. There is no nausea, and the food returned has its proper agreeable taste. Occasionally blood may be present. (4) Profuse secretion of saliva. Gottstein states that 150 c.cm. may be secreted in ten to fifteen minutes. (5) Loss of flesh, weakness, cachexia.

The pathological conditions at the lower end of the oesophagus which may give rise to stenosis are: Cancer of the oesophagus or cardiac portion of the stomach; mediastinal tumours and other extra-oesophageal diseases leading to compression of the oesophagus; cicatrices; idiopathic hypertrophy of the oesophageal musculature; and spastic affections.

Cancer.

Next to the cervical end, the cardiac region is the most frequent site of cancer in the oesophagus. In the latter situation the age incidence is not strikingly early, nor are the majority of subjects females, as in the former. The chief and often sole symptom is dysphagia, which usually sets in slowly. Spasm plays an important rôle in most oesophageal diseases, and particularly when these are situated in the region of the cardia; consequently long before the neoplasm has attained a size capable of causing obstruction complete dysphagia may be produced by spasm.

Malignant disease in the middle portions of the oesophagus in some cases appears to progress very slowly and to have periods of improvement. Such alternations are not characteristic of cancer at the lower end, owing to the constriction of the oesophagus and the comparatively unyielding nature of the surrounding tissues. The presence of blood in vomited or regurgitated fluid, in the oesophagus on inspection, and a marked tendency for the tumour to bleed, all point to malignant disease. The appearances produced by cancer in the lowest part of the gullet, as seen by direct examination, vary greatly. They depend upon the type, mode of extension, stage, etc., of the disease. The presence of ulceration, granulations, papillomatoid or polypoid proliferations, proclaims almost indubitably the malignant nature of the disease. In rare instances a peptic ulcer has to be differentiated.

On the other hand, the submucous type of cancer may closely resemble certain spastic affections of the cardia, and therefore requires more detailed consideration. It is just in those cases in which we are most doubtful of the diagnosis, owing to the mucous membrane being smooth and intact, that we are precluded, as a rule, from excising a piece of the tumour for histological examination. Careful observation of the endoscopic appearances is, therefore, the more necessary. V. Hacker has described a condition of leucoplakia in the oesophagus as an almost constant accompaniment of cancer even in its early stages. Authorities are not inclined to attach value to this sign.

The neoplasm may be at an early stage and limited to a small area immediately above the cardia. The infiltrated part of the wall may then project into the lumen, giving it a crescentic shape; it moves during respiration less freely than the surrounding parts, and its surface is smooth, stretched, intact, and very red, although occasionally pale. Very soon the surface ulcerates or becomes nodular, and the true nature of the bulging is evident, or may be determined by removal and examination of a fragment. The malignant process may be more advanced, and may involve the entire circumference, producing an annular constriction If it develop uniformly, a funnel-shaped stenosis will result. This has to be distinguished from the funnel-like constriction due to corrosive action. In the latter case the funnel is deeper, its surface is more uniformly smooth, and scarring may be seen above. When caused by cancer the surface is often nodular and ulcerated, and the mobility of the parts during respiration is diminished or absent. In both cases the oesophagus may be somewhat dilated above the constriction.

The oesophagus may be normal as far as the hiatus oesophageus, and the disease causing the dysphagia may be located beneath the diaphragm. In our efforts to traverse the epicardia-cardia it is most important to carry out all manipulations with caution, and to employ no undue force in attempting to pass the oesophagoscope deeper. The danger is not so much of perforating with the point of the instrument as of tearing the neighbouring diseased tissue in consequence of the parts being put on the stretch.

When the cancer is in the diaphragmatic canal the difficulties of inspecting the parts are great. In the normal subject the passage of a tube into the stomach is not always easy, so that when an apparent obstruction is encountered it is necessary to allow for the natural tonus of the cardia as well as to keep in view the possible presence of a neoplasm. Owing to the limited field of view in this situation one must content oneself, as Starck advises, with the detection of very slight changes, and, if need be, examine repeatedly with the patient in different positions in order to get a characteristic aspect. If the neoplasm is in the stomach it may cause obstruction by submucous infiltration and narrowing the cardiac orifice. One looks for a tumour-like prominence or fold and particularly for an ulcerated or readily bleeding surface. Tapia has pointed out in connexion with one of his cases that the respiratory movement of the fluid lying at the cardia instead of being up and down as usual is from side to side. He considers that this appearance allows of an exact diagnosis being made of the site and extent of the tumour. In the case in question the neoplasm was seen in the lowest part of the oesophagus on the right wall. This, however, was merely part of a large growth which sprang from the small curvature of the stomach and extended across beneath the cardiac opening. Its upper surface served as a resting place for fluids, hence the horizontal oscillations.

Compression Stenoses.

Stenosis in the region of the cardia in consequence of extra-oesophageal pressure is nearly always due to a mediastinal tumour. Starck reports a rare case due to a calcareous plate in the pleura, which at first excited

spasm of the oesophagus and cardia, and later led to fatal perforation. Guisez has seen stenosis and displacement of the cardia produced by aneurysm of the aorta in one patient, and by cancer of the liver in another. A tumour of the great curvature may act similarly. The oesophagoscopic appearances may be indistinguishable from those produced by submucous cancer. There is the same encroachment on the lumen by a smooth bulging of the wall. The covering mucous membrane is usually intact and normal in appearance, but may be nodular or ulcerated. The affected part does not move during respiration. The symptoms of oesophageal stenosis develop insidiously, and before they are marked the mediastinal growth has attained considerable dimensions and is evident on *x*-ray examination. Percussion may also assist the diagnosis.

Guisez emphasizes his observation that in stenoses by compression dysphagia is quite out of proportion to the degree of obstruction. This he attributes to spasm.

Cicatrices.

The history of having swallowed a corrosive is often considered sufficient to establish the diagnosis. This is not always to be relied upon. The stenosis may develop very slowly and years may elapse between the date of the accident and the onset of the signs of obstruction. On the other hand, it is not uncommon for patients to attribute their dysphagia to an injury from hot liquid or food, or a foreign body, and on examination to be found suffering from malignant disease. Investigations into the mechanism of deglutition have shown that solid food is carried comparatively slowly down the gullet by peristalsis, while liquids are projected rapidly or squirted to near the cardiac end by the muscles of the mouth. The facts noted in the cases that I have examined—namely, that cicatrices due to corrosive liquids are found in the lower part of the oesophagus, while those due to solids are in the upper part—are in accordance with the physiological observations mentioned. Guisez has found cicatricial stenosis in the neighbourhood of the cardia, in five patients probably due to a round ulcer, and in other five as a consequence of chronic oesophagitis. In the latter group of cases the primary condition was spasm of the cardia, which, by causing retention of food, set up inflammation, infiltration, and concentric cicatricial contraction. A sound localizes the site of the stricture, *x* rays give additional information as to its permeability, but only the oesophagoscope allows of a positive diagnosis being made as to the situation, nature, form, and degree of the obstruction. In old cases one usually sees a funnel-shaped constriction or diaphragm-like partition, with a more or less small aperture in the middle or to one side, and a surrounding smooth, pale, cicatricial surface. Several strictures may be superposed. If the lumen is much reduced the oesophagus may be dilated above, and may contain food débris and saliva.

Idiopathic Muscular Hypertrophy.

Only very few cases of primary muscular hypertrophy of the oesophagus are on record. Elliesen has carefully studied the condition, and his case may be taken as typical. The patient was a man, aged 39, who died of tuberculous meningitis. The oesophagus, excepting above, was converted into a rigid, thick, uniform tube. The dense leather-like wall was cut with difficulty. The lumen in the lower 18 cm. was found to be 9 mm.; the narrowest physiological diameter, according to Kraus, is 10 mm. The most important change was an enormous thickening, especially of the inner circular muscular layer, which in the lower third amounted to 7 mm., so that the whole wall measured 9 mm. instead of 2 mm., which is stated to be the normal thickness. The external longitudinal muscular layer participated but little in the thickening. No other change could be detected. Ehlers more recently has met with a similar hypertrophy of the oesophageal musculature, which he regards as probably congenital, associated with congenital hypertrophic stenosis of the pylorus. In this case there was an immense thickening of the muscular wall, which a short distance above the cardia amounted to 12 mm. No other pathological condition was found in the oesophagus; its lumen was normal. In neither of the above cases was there dysphagia, although Elliesen's patient had to masticate carefully and eat slowly from his fifteenth year. It is possible that the dysphagia might have increased had he lived longer, and that death might have taken place from inanition, as occurred in the earlier recorded cases. Both writers discuss the etiology of the hypertrophy, but neither can assign a probable cause; Elliesen, therefore, considers himself justified in regarding it as idiopathic; while Ehlers, viewing it in conjunction with the hypertrophy of the pylorus, believes it to be congenital. I think that cardiospasm would explain both cases. An increase in the lumen of the oesophagus does not invariably accompany spastic closure of the cardia, and it was just because of the absence of dilatation that both authors excluded cardiospasm as a possible cause. I am therefore not prepared to regard this condition as a distinct entity.

Paralysis.

Paralysis of the gullet is extremely rare, but the symptoms to which it gives rise may cause it to be confused with stenosis at the cardia. The patient may be unable to swallow solids, while liquids pass easily; he may have pain behind the sternum during eating, and he may vomit frequently quantities of mucus. Our fears as to the grave nature of the ailment are set aside by the result of the examination. On auscultation the first deglutition sound may be heard if there is insufficiency of the cardia. A bougie passes readily into the stomach. The oesophagoscope is introduced with unusual ease, the parts appearing to be almost insensitive; there is no sign of disease in the gullet, and the epicardia-cardia is not unduly contracted. In order to test the musculature Starck advises that a large capsule or pill be passed 27 cm. down the oesophagus; if the musculature is normal it will be carried into the stomach by peristalsis, if there is paresis it will not change its position.

Spastic Affections.

The last group of stenoses in the region of the cardia to be considered is that of the spastic affections. We here enter upon a subject that is highly controversial from the standpoint of the anatomist, physiologist, pathologist, and clinician.

Spasm plays a very important part in affections of the oesophagus—for the moment I am speaking of the oesophagus as a whole and not of the cardiac end only. It may be either primary or secondary. We are all acquainted with secondary spasm, to which many strange and sometimes misleading clinical phenomena in the oesophagus owe their origin.

I may mention several examples. In oesophageal cancer not uncommonly the first symptom is sudden and complete inability to swallow, which, after a variable duration, passes off entirely. A patient with cancer at the lower end of the oesophagus may locate the dysphagia at the upper end owing to spasm. In another patient symptoms may point to obstruction at the cardia, and this may be confirmed by a bougie, whereas the neoplasm is beneath the mucous membrane in the middle portion of the oesophagus, and is still too small to interfere with sounding. The power of deglutition in patients with cicatricial stenosis may vary much from day to day, as may also the ease with which a bougie is passed, owing to spasm.

The most convincing demonstration that I have had of the rôle played by spasm was in a man brought to me on account of a piece of meat having stuck in his throat. Oesophagoscopy showed, at the level of the arch, a funnel-shaped stricture in the lowest part of which lay some dark material. This was extracted and found to be a fetid pultaceous mass about the bulk of a pea. Its removal was immediately followed by relaxation of the spasm and the patient drank off a tumblerful of water after having been unable for three days, all but four hours, to get a single drop down.

I now pass to the consideration of an affection which, in most instances, owes its origin to primary spasm—I refer to cardiospasm.

Oesophageal Aspect of Cardiospasm.

The normal aspect of the hiatus oesophageus varies in different persons, and even from time to time in the same person. It often appears as a cleft running obliquely forward and to the left, with a rounded fold in front and to the right, and another behind and to the left; it may also have a stellate appearance. Occasionally it opens

a little, especially if a deep inspiration be taken, and scanty mucous secretion wells up. In cardiospasm the appearance of the hiatus oesophageus may be the same as in the normal state. On the other hand, certain characteristic features may be produced by the contraction. The folds bounding the obliquely running cleft, or those radiating from the point like lumen, may bulge unduly and produce an appearance like the os. The mucous membrane over the most prominent parts may be pale and traversed by blood vessels, or, if irritated by retained food, may be inflamed. During the spasm there is no variation in the lumen with respiration, and no bubbling up through it of fluid or gas. Starck states that he has seen the hiatus free while spasm at the cardia produced a funnel-shaped constriction.

Having noted the points mentioned, the tube is now gently pressed onward. The parts may be found excessively sensitive, and an unusual amount of resistance may be experienced; but on waiting a little relaxation takes place, and the instrument glides along the abdominal section of the gullet and enters the stomach. Lerche states that in no case of cardiospasm is the epicardia-cardia impermeable. Starck distinguishes spasm in the diaphragmatic portion of the oesophagus from spasm at the cardia, and states that in the former he has found the closure so tight as to be insurmountable, while at the latter he has never met with muscular resistance. Spasm at the cardia may produce a stellate arrangement of folds, some of which may consist of gastric mucosa.

In carrying out these manipulations the oesophagoscope should be passed from the right angle of the mouth and the patient's head bent to this side. The tube should be carefully kept in the axis of the gullet. Resistance at the cardia should, if possible, be overcome by cocaine, gentle pressure, and patience. It may be necessary to repeatedly alter the position of the patient before entrance to the stomach is effected. Lying on the side relaxes the crura of the diaphragm (Gottstein), and probably the right recumbent position, as recommended by Starck, is best of all. In order to diminish the profuse secretion which usually collects above the stenosis atropine may be given beforehand.

Diagnosis of Cardiospasm without Dilatation.

It will be gathered from what has already been said regarding compression stenoses and stenoses due to cancer at the cardia or in the diaphragmatic part of the gullet that the differential diagnosis of these conditions from cardiospasm is sometimes extremely difficult; at present I am referring to cardiospasm without dilatation.

Compression stenosis above the diaphragm can usually be recognized by the asymmetry produced; pressure below the diaphragm may alter the direction of this part of the gullet. When the abdominal oesophagus is involved, either by infiltration of its wall or by external pressure, inspection may fail to differentiate the condition from cardiospasm. If difficulty is experienced in entering the stomach in spite of the adoption of the manipulative measures recommended it is best to suspect the presence of malignant disease. Repeated examinations should then be made at intervals, with the object of detecting the development of irregularities or ulceration in the neighbourhood of the cardia. Any attempt to pass the oesophagoscope into the stomach should be made with great gentleness. It is necessary not only to keep the instrument completely under control of the eye and hand but to bear in mind that extremely vulnerable diseased tissue may be in the immediate vicinity. If the state of the patient do not allow of delay, let gastrostomy be performed, and settle the diagnosis later.

Dilatations of the Oesophagus.

Stenoses at the cardia are liable to be followed by dilatation of the part of the oesophagus immediately above. When the stenosis is due to cicatricial contraction, extra-oesophageal compression, or malignant infiltration of the wall, the dilatation, if present at all, is, as a rule, insignificant. In cardiospasm it may also be *nil*, but on the other hand it may be immense. A marked dilatation, with symptoms of obstruction at the lower end of the oesophagus, is therefore strongly suggestive of cardiospasm. The cases in which a differential diagnosis is so difficult and to which reference has just been made are those of cardiospasm without dilatation.

Angulation and Kinking of the Oesophagus.

The oesophagus not infrequently undergoes marked deviation, sometimes with elongation; the elongation may be associated with, or independent of, dilatation. The normal length of the oesophagus is about 25 cm.; in a case of Luschka's it measured 46 cm. When the elongation is such as to cause the gullet to approach the hiatus diaphragmaticus obliquely, kinking may be produced and symptoms of dysphagia may arise. It is probably only under such conditions that the crura of the diaphragm play a part in causing obstruction. In the later stages of cardiospasm with dilatation the dysphagia therefore is chiefly mechanical. The recumbent position is then specially unfavourable for deglutition, as the food gravitates to the deepest part of the sac and cannot get into the stomach.

Kovács and Stoork have recently studied the condition of the oesophagus in enlargement of the heart. They show that as a result of enlargement, especially of the left auricle, the oesophagus may be markedly compressed and deviated. The bend, which may approach a right angle, passes to the right and backwards, and the lowest part of the gullet in order to reach the opening in the diaphragm must cross the aorta almost horizontally. They also prove by *x* rays that ingesta may be delayed above the bend. Starck has found the mucous membrane in this situation very inflamed, a condition which he assumed to be due to the temporary retention of food.

Bending of the oesophagus is recognized during direct examination by the difficulty or impossibility of keeping the lumen of the gullet opposite the end of the oesophagoscope even when the tube and patient's head are bent unduly to the right or forward.

Symptoms.

Occasionally a dilatation of the oesophagus is found at a necropsy without there having been any symptoms to suggest its presence during life. As a rule, however, symptoms are manifested. These may set in suddenly and be very marked, some form of dysphagia being the most prominent; or they may develop insidiously, so that years may elapse before the affection causes trouble. A characteristic and frequent symptom of dilatation is regurgitation. This is unaccompanied by nausea or retching, and may be brought about merely by increase of intrathoracic pressure without active contraction of the gullet. The regurgitated fluid consists of undigested food and mucus, is usually alkaline, but if long retained may be slightly acid; it contains lactic acid, but no hydrochloric acid or pepsin.

It is not surprising that patients complaining of vomiting and epigastric pain, amongst other symptoms, are regarded as suffering from disease of the stomach. A fair number of cases are recorded in which gastro-enterostomy was performed for persistent vomiting, and at the *post-mortem* examination the disease was found in the oesophagus and not in the stomach. In cases of violent, cramp-like pains in the epigastrium, Gottstein emphasizes the importance of keeping in view not only affections of the stomach and gall stones, but also spasm of the cardia. In all of his cases of cardiospasm the disease had been treated for years, or even decades, as ulceration of the stomach or gall stones.

Rumination.

In connexion with regurgitation reference should be made to merycism or rumination. Some of the published reports of cases of rumination strongly suggest that the patients had stenosis at the cardia with regurgitation. The correctness of the diagnosis in these cases becomes more doubtful when no mention of the latter condition is found, and when at the *post-mortem* examination of some ruminators dilatation of the lower part of the oesophagus is stated to have been present.

Well-marked cases of regurgitation and rumination are easily distinguished, but in some individuals the symptoms may not be characteristic, and the distinction may be difficult. In rumination heredity often plays a part. The process may set in at any age, even in childhood. It begins from a few minutes to half an hour after meals; mouthful after mouthful of the food is returned, chewed, and swallowed; and this may go on for an hour or until next meal. The food is pleasant, but may become sour if

the rumination continue longer than two hours; it contains hydrochloric acid and pepsin.

Diagnosis.

Various tests have been devised to prove that the oesophagus is dilated, and that it can retain a large quantity of fluid without allowing any to escape into the stomach. Thus a stomch tube is passed and 200 c.cm. of methylene blue solution poured into the stomach. The tube is then removed, and the patient drinks 200 c.cm. of milk. Again the tube is introduced a distance of 30 cm., and unchanged milk is obtained, and on being passed to 50 cm. blue-coloured fluid returns. The capacity of the dilated oesophagus can be conveniently measured by Lerche's oesophagometer. *X* rays give valuable information as to the size and shape of the dilatation.

Endoscopy surpasses all other methods in the extent and accuracy of the information it affords regarding oesophageal dilatations. When the oesophagoscope is in the lower third of the gullet, instead of being able to overlook the entire or greater part of the circumference, we find, if the patient is seated, that more or less of the wall passes out of sight and that we are looking into a large cavity. During expiration the dilatation will be at its smallest and the walls best seen. If the patient is recumbent during the examination, a fold of the overlying wall may dip down and cover the end of the tube and present no respiratory movements. It will also be found that in order to bring into view opposite points in the circumference of the gullet the tube must make a considerable excursus. The lining membrane of the dilatation is crossed by transverse folds and is inflamed or superficially ulcerated; usually it contains fluid, food, debris, and mucus. The inspection must, lastly, discover any malignant tumour that may be present. The association of diffuse dilatation and cancer has been noted by several observers.

Etiology of Oesophageal Dilatations.

The first important contribution towards the elucidation of dilatation of the oesophagus was made by Zenker in 1878. This writer published reports of a series of cases in which the patients died with symptoms of severe dysphagia, and at the necropsies oesophageal dilatation was found, but no stenosis; he thought the condition was due to diminished power of muscular contraction. In 1881 Strümpell, in discussing a similar case, raised for the first time the question of spasmodic closure at the cardia as a cause; he dismissed this, however, in favour of the view that there was kinking at the hiatus oesophageus and secondary dilatation in consequence. V. Mikulicz in 1882 made the first oesophagoscopic examination of the affection; he attributed it to spasm at the cardia, and therefore termed it cardiospasm. In almost all cases of so-called idiopathic dilatation of the oesophagus there is spastic closure at the cardia, as indicated by the symptoms, appearance, abnormal resistance, and the fact that cure is effected in a large proportion of cases by stretching the cardia. The study of the etiology of dilatation of the oesophagus is thus inseparably bound up with that of cardiospasm. Before proceeding to consider the theories that have been advanced to explain these associated conditions it is necessary to discuss certain objections that have been raised to the existence of primary spasm of the oesophagus.

Does Primary Spasm of the Cardia Exist?

Dr. William Hill, whose exceptionally large experience in oesophagoscopy entitles his utterances on the subject to our respect, has recently published a paper denying the possible existence of primary spasm at the cardiac end of the oesophagus. In support of his contention he asserts that the circular fibre musculature at the extreme lower region of the oesophagus is weak, and, if anything, weaker than elsewhere, and quotes passages from Professor Macalister's *Textbook of Human Anatomy* to show that there is no special muscular sphincter in this region.

In order to obtain first-hand evidence as to the condition of the musculature at the junction of oesophagus and stomach, Dr. Williamina Abel, Carnegie Research Fellow in the Physiological Department of the University of Glasgow, has made a number of dissections. These confirm the correctness of Professor Macalister's description as quoted by Dr. Hill. Two of the preparations are shown—one from a child a few days old, and the other from an adult. They include the lower part of the oesophagus and upper part of the stomach. Each has been slit up and the muscular layers separated. It was found that the longitudinal coat was uniform throughout, while the circular coat was peculiar only in that it was very closely connected with the submucosa for 1 to 2 cm. above the cardia. It is quite apparent to the naked eye that both muscular coats are of uniform thickness, and that no special aggregation of fibres exists at or near the cardia. On the other hand, nothing was found in any of the dissections or in the anatomical works consulted to justify Dr. Hill's statement that the circular fibre musculature was specially weak in this region. I would point out, however, that "the modern supporters of the spasmodic theory" do not seek to explain spasm at the lower end of the oesophagus by the presence of a sphincter. The few writers who have employed the term "cardiac sphincter" have probably done so rather as a matter of convenience than from any desire to account for the pathogenesis; had they used the expression "sphincter-like appearance" in reference to the hiatus oesophageus, no objection could have been raised. The true explanation of cardiospasm will probably be found to lie in a disturbance of innervation; to this important aspect of the question Dr. Hill has barely referred. Mention will be made immediately of the various theories that have been advanced in this connexion, but I may conveniently preface them by recounting a few physiological facts which will also serve to prove that spasm at the cardia is possible.

From experimental work it has been found that stimulation of the peripheral ends of the cut vagi causes contraction of the whole oesophagus but dilatation of the cardia; this is essentially the normal process of deglutition. On the other hand, section of the vagi without stimulation is followed by dilatation of the lower part of the oesophagus and contraction of the cardia; this corresponds to the supposed condition in cardiospasm. The vagi thus control the muscular action —the peristalsis—of the oesophagus and supply a special dilator branch to the cardia. Tonic contraction at the cardia is maintained by the autonomous nervous system, which consists of a fine plexus situated between the two muscular coats under control of ganglia which are independent of the central nervous system. Normally, this tonic contraction is inhibited during deglutition by impulses conveyed along the vagi, and the cardia opens to allow the food to enter the stomach. Secondary closure of the cardia is due to reflex action excited by the acidity of the gastric juice. [The author then showed a series of slides illustrative of various points raised.]

Returning to the clinical aspect, the question that next suggests itself is: Have we a correct conception of spasm as it exists at the cardia? We are accustomed to associate in our minds with the term "spasm" a condition of violent muscular contraction, but if we read the reports of a number of cases of cardiospasm we find that almost invariably the obstruction at the cardia is stated to have yielded on waiting a little. Some writers assert that the cardia-epicardia is always permeable in cardiospasm. In this connexion I might mention that even in animals with both vagi cut, when the spasm is undoubted, it can be overcome comparatively easily by increasing the intra-oesophageal pressure. At one time I myself held a different opinion, and in consequence experienced a mishap that I shall always regret. In a patient with great dysphagia, but with no sign of disease in the oesophagus excepting firm closure at the hiatus, my efforts to overcome what seemed to me to be strong spasm caused a tearing of neighbouring diseased tissue with fatal result. Secondary spasm may certainly have been present in this case, but the main resistance encountered was due to subdiaphragmatic carcinoma. Dr. Hill states that from his endoscopic observations spasm of a really unyielding nature is not found. Has he not been looking, as I did, for what is non-existent? It might be advisable for all of us to remember that in cardiospasm the spasm is of a yielding character and little more than a state of non-relaxation.

Theories as to the Causation of Diffuse Dilatation of the Oesophagus.

1. *Primary Cardiospasm.*—The first explanation of oesophageal dilatation, as already stated, was offered by v. Mikulicz, who attributed it to the retention of food, etc., above the spastically contracted cardia. In support of this view, it is pointed out that a stenosis of comparatively short duration, as in cancer, is occasionally found associated with a certain amount of dilatation. In cardiospasm, which may go on for years or even decades, great dilatation need, therefore, excite no surprise. The muscular hypertrophy of the walls of the distended organ suggests the presence of obstruction to be overcome, as in valvular disease of the heart. Meltzer goes a step further. He believes in the presence of cardiospasm, and attributes it to inhibition of the cardia dilator. In consequence, the cardia instead of relaxing during deglutition, as it normally should, remains firmly closed. Rosenheim opposes the theory of primary cardiospasm because marked and extensive dilatation of the oesophagus above anatomical strictures, both benign and malignant, is comparatively rare, and further, because obstruction at any part of the oesophagus to the passage of ingesta produces, if the muscular strength of the organ be well maintained, regurgitation, but no dilatation.

2. *Primary Atony.*—Another group of observers maintains that the dilatation is primary. Rosenheim, the chief exponent of this theory, attributes dilatation to atony of the oesophageal musculature, followed by overstretching and distension of the walls, and regards the spasmodic closure of the cardia as secondary and produced by the irritating action of stagnating collections of food on the altered mucous membrane. Quite recently the atonic theory has received support from Holzknecht. His extensive *x*-ray researches have led him to recognize in a large proportion of those suffering from nervous dysphagia a characteristic condition which he regards as due to an atonic state of the oesophageal musculature. When very thick semisolid food is swallowed normally it passes through the gullet as a closed column, the length of a finger, in about seven seconds. In the affection in question, on the other hand, each portion of semisolid is pushed onward by that next swallowed until a continuous stream courses through the gullet. A variable interval, often a quarter of an hour, may elapse before all reaches the stomach. The dysphagia may be overshadowed by various neurotic symptoms—for example, cramp-like feelings in the throat and chest, retching, attacks of choking, and occasionally inanition may result.

Starck admits the possibility of atony leading to dilatation, but states that no case has been proved, for almost without exception muscular hypertrophy is found at *post mortem* examinations. This has not been my experience, for in a comparatively small material I have met with thinning twice, in one case to a very marked degree. A case of Lerche's reported this year promises to throw light on the nature of the disease, and to open up new possibilities in its treatment. A piece of banana had stuck in the patient's throat; afterwards she experienced delay in the passage of food through the upper part of the chest, and subsequently was unable to get anything into the stomach. *X* rays showed a sausage-shaped dilatation. There was not much obstruction to food at the lower end of the oesophagus, but it passed slowly through the upper part. The galvanic current was applied to the interior of the oesophagus in this region, which was undoubtedly in a state of atony. The electrode consisted of four thin steel felt-covered springs. After twenty applications there was surprising improvement, and after ten more the epicardia-cardia was stretched. Two months later the oesophagus was found, on examination, almost normal. More than a year after treatment the patient was feeling perfectly well. In this case, according to the author, the primary disturbance was atony of the upper thoracic part of the oesophagus, which delayed the passage of food and thereby irritated the epicardia-cardia to spasm.

3. *General Neurosis.*—The view that simultaneous dilatation of the oesophagus and spasm of the cardia is due to a general neurosis was advanced by Kraus as a result of his observation of a case in which after death atrophy of both vagi was found. He considers that it reconciles the two apparently antagonistic theories already described. To explain his standpoint I may again remind you that if vagal transmission is interfered with the oesophageal walls will relax, while the cardia will remain closed and obstruct the entrance to the stomach.

These facts justify one in speaking of a paralytic dilatation of the oesophagus; they also explain why after death dilatation is found, but no anatomical stenosis. On the other hand, they fail to explain the hypertrophy that exists in a large proportion of cases. If the musculature of the oesophageal walls is paralysed in accordance with Kraus's theory, it will not undergo hypertrophy.

Kraus does not assert that atrophy of the vagi is always present in oesophageal dilatation—in fact, he refers to cases in which these nerves and their oesophageal branches were demonstrated to be normal; he desires rather to lay weight on the importance of taking the vagi and their connexions into consideration.

4. *Neurosis of the Autonomous Nervous System.*—The action of the autonomous nervous system in maintaining tonic contraction of the cardia has just been referred to, and it is easily conceivable that the tonus of this system may be increased so that normal impulses conveyed by the vagi are too weak to inhibit, and cardiospasm results.

In Kaufmann's case, which was the first of the kind reported, of the four nerves which receive sympathetic supply and which react similarly pharmacologically—namely, the vagus, oculomotor, chorda tympani, and pelvic (erigens)—three were affected.

Last year Heyrovsky reported a case of this nature. The patient was an exceedingly nervous woman who had increased tendon reflexes, absence of corneal and pharyngeal reflexes, and symptoms of heightened tonus of the autonomous nervous system, as indicated by cardiospasm, dermography, abnormally profuse sweating, eosinophilia, hyperacidity, and marked sensitiveness to pilocarpin. There was no slowing of the pulse. A beneficial effect from atropin could not positively be shown, as other therapeutic measures were employed.

Further evidence pointing to the nervous origin of cardiospasm is afforded by the nature of the exciting causes and the temperament of some of the patients. A number of cases date from an injury received—for example, a blow on the abdomen or chest, a fall on the back, lifting heavy weights; others are traceable to the violent vomiting of pregnancy or sea-sickness. Such causes are capable of producing local lesions involving centres independent of the central of the nervous system.

You will recall the fact that after the entrance of food into the stomach the cardia is reclosed by the acidity of the gastric juice. It is easily conceivable that hyperacidity may give rise to undue contraction of the cardia or interfere with its normal dilatation. Hyperchlorhydria is probably, therefore, a potent exciting cause of cardiospasm. The onset of the disease has been occasionally traced to psychical disturbances, and its course has been found to be influenced by emotions, moods, exertion, etc. In such cases the patient was frequently neurasthenic or hysterical. The bolting of imperfectly masticated or large pieces of food is supposed to be capable of producing oesophagitis and consequent spasm and atony.

5. *Anatomical Abnormalities.*—Having disposed of the innervation theories of cardiospasm, I shall now very briefly refer to certain other explanations that have been advanced to account for dilatation at the lower end of the oesophagus.

Luschka has described dilatations limited to a small part of the oesophagus above and below the diaphragm, which he has termed respectively the fore-stomach and cardiac antrum. The fore-stomach has been proved by Zenker to be congenital, and Fleiner has seen it in the living and dead subject as a dilatation resembling a sac or diverticulum. The condition may long remain latent until for some reason its function is disturbed. In these cases, however, the dilatation or fore-stomach is circumscribed and is quite distinct from the diffuse dilatation we have been considering. The former may therefore be regarded as a rare variety. The congenital origin of this small class throws no light on the etiology of the typical diffuse dilatations ordinarily met with. Congenital narrowing of the cardia has been offered as another explanation of diffuse dilatations. The circumference of the normal cardia is stated to be 6.9, 5, and 5.5 cm. by v. Hacker, Leichtenstern, and Stierlin respectively. Stierlin reports

a case of great dilatation in which the cardia was only 2.8 cm. and refers to other similar cases.

In connexion with congenital abnormalities the investigations of Mehnert may be mentioned. This observer found thirteen physiological narrowings of the oesophagus; the spindle-shaped segment between each two he termed an enteromere. The fore-stomach corresponds to Mehnert's eleventh oesophageal enteromere; while the narrowing of the cardia just referred to might be attributed to the persistence of the thirteenth physiological constriction. The fact that other developmental defects were present in some of the cases supports the view of a congenital origin.

Conclusions.

In conclusion, I venture to express the following opinions: Under the term "cardiospasm" several distinct pathological conditions have been included. Those due to developmental or anatomical abnormalities should allow of differentiation and correct classification. The existence of primary cardiospasm is undeniable. Cardiospasm alone accounts for the *ante-mortem* and *post-mortem* conditions found in some cases. In others it affords an insufficient explanation, and further investigation is demanded. The disease is sometimes located in the extrinsic nervous system, as manifested by degenerative changes in the vagus or its oesophageal branches. The most frequent seat of the lesion is probably the intrinsic nervous system, and the disturbing cause an injury, hyperacidity, or other influence exercising a harmful action on the ganglia. A fuller knowledge of the physiology of the autonomous nervous system is likely to assist in elucidating the pathology of cardiospasm.

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DISCUSSION.

Dr. William Hill (London) gave a lantern demonstration of some seventy slides illustrative of oesophageal stenosis. In the course of it he said that pulseon diverticula, or pressure pouches, were purely peri-oesophageal, and caused dysphagia by extrinsic pressure on the cervical oesophagus. The dissections of Keith, Killian, and others showed that they were localized ectasia of the post-cricoidal pharynx, the mucous, submucous, and fibrous coats forming the wall of the hernia. The diverticulum passed out between the oblique and fundiform fibres of the crico-pharyngeus (inferior constrictor) muscle. The mouth of the diverticulum could always be demonstrated both by endoscopy and radioscopy (with bismuth paste) on the posterior wall of the post-cricoidal pharynx. Killian was wrong in describing these diverticula as arising immediately above the mouth of the gullet as the fundiform fibres of the crico-pharyngeus intervene, and he was equally wrong in describing this fundiform bundle of fibres as the sphincter of the mouth of the oesophagus, as it was of course a part of the pharyngeal musculature and sphinctered the deep pharynx. These diverticula were purely pharyngeal in origin and could not be correctly described as oesophageal or as pharyngo-oesophageal as is often done. The mouth of the gullet was situated at the lower border of the crico-pharyngeus (inferior constrictor) muscle and had no specialized sphincter development of its own either at its mouth or at its termination. The term "cardiospasm" commonly applied to phreno-cardiac stenosis was usually, if not invariably, inaccurate. In most of these cases the lesion was a true anatomic stricture, of the nature either of cicatricial contraction or else of hypertrophic stenosis or of soft inflammatory tumefaction; exceptionally the passage of food might possibly be interfered with merely by kinking or else by a want of co-ordinate active opening up of the phreno-cardiac gullet during swallowing, which might be accounted for by atony of the longitudinal musculature of the gullet and the radiating fibres of the stomach near the cardia. The speaker had failed to find evidence of primary spasm, whether paroxysmal or continuous, in the region of the cardia; and the assumption that long-continued primary spasm could give rise secondarily to a permanent anatomic spastic contracture at the cardia was entirely unproved. Deglutitory cramp of a short paroxysmal character and always more or less painful was often observed as a secondary symptom in acute and chronic gullet stricture and also when large foreign bodies were impacted. But was there any convincing evidence that deglutitory cramp was ever primary anywhere in the gullet, or that it produced secondary functional stricture of the cardia? The term "cardiospasm" had been in the past loosely applied to undoubted anatomic—that is, organic—narrowings of the lumen in the region of the cardia, as well as to almost every case of phreno-cardiac dysphagia of uninvestigated or unknown etiology and pathology. The time had come for the adoption of a more accurate nomenclature.

Dr. Walker Downie (Glasgow) held that primary spasm of the cardiac orifice did as a matter of fact occur. This opinion was based on a case which he had seen some years ago in consultation with a physician in the Western Infirmary of Glasgow. The patient was a man over 60 years, who had much difficulty in swallowing, and most of the food swallowed returned after an interval, and he was losing flesh steadily. A large bougie could be passed readily down to the cardiac orifice of the stomach, beyond which it or any smaller one could not be passed. Some time later the patient died. At the *post-mortem* examination, performed by the pathologist of the hospital, the oesophagus was found to be thoroughly healthy, with no malignant disease of its walls nor in any of the neighbouring structures, and the conclusion then formed was that the difficulty was due solely to spasm.

The President agreed with Mr. Waggett that the blind passage of a bougie should not be practised, but did not consider there were a sufficient number of men able to pass the Killian tube, and that under these circumstances the passage of a bougie was the lesser evil.

Dr. Harris P. Mosher (Boston, U.S.A.) said the *x*-ray plate was often misleading in the diagnosis of oesophageal pouch. He had had two cases where the oesophagoscope proved an apparently typical plate to be wrong. The use of a widely open tubular speculum made it possible to learn the condition of the oesophagus in the cricoid region, and to dispense with the mandrin for the introduction of the tube. He preferred making examinations

under a general anaesthetic, because he was trying to get a view of anything, and wanted that view to be as large as possible. In his examinations a tube 20 mm. in transverse diameter was used, and he felt that at times even larger tubes might be employed. The larger the tube the larger the field, and the greater the field the more accurate the diagnosis which it afforded. A negative examination under cocaine meant that everything had to be done over again. Not only was a more exact diagnosis possible under a general anaesthetic, but the treatment which could be carried out was far more efficient. In the dilatation of fibrous strictures, for example, one dilatation under ether or chloroform would accomplish what it took months to secure under local anaesthesia.

Mr. JOBSON HORNE (London) could not accept, as of general application, the proposition that the use of the oesophageal bougie should now be condemned. The time had not arrived for regarding the oesophagoscope as fully developed or the bougie as an obsolete instrument; in fact, two of the readers of papers introducing the discussion had respectively drawn attention to the limitations of the former and the utility of the latter instrument. The oesophagoscope at present was in only a few experienced hands, and a good deal of useful work could be done still with the bougie in conjunction with the *x* rays. The physiological, functional, and malignant forms of stenosis of the gullet, he considered, might be co-ordinated, as the sites of occurrence were commonly the same in all three. In his experience foreign bodies lodged in the mouth of the oesophagus could be detected and removed as readily and with less discomfort to the patient by the indirect method under the guidance of the mirror as by the oesophagoscope. The latter undoubtedly in other cases saved a good deal of groping in the dark. Of the diseases causing stenosis of the oesophagus, syphilis, he considered, ranked second to malignant disease, but relatively it was by no means so frequently met with. Tuberculosis of the oesophagus, comparatively speaking, was rarely met with, excepting in the last stages of pulmonary phthisis. Owing to the enforced recumbent position, the ulceration occurred on the posterior wall, and the cicatrization seldom reached the stage of stenosis.

Dr. BRONNER (Bradford) thought it was not always necessary or advisable to give a general anaesthetic for the use of the oesophagoscope. In many cases due to projecting teeth, a thick neck, etc., it was impossible or very painful to use the oesophagoscope. If the bougie were olive-shaped and passed with care, there was not much danger to the patient; in fact, much less danger than the use of the oesophagoscope in unskilled hands. Strictures of the upper part of the oesophagus were frequently of non-malignant nature and due to fissures of the mouth of the oesophagus.

Mr. C. W. M. HOPE (Newcastle-on-Tyne) said general anaesthesia was in almost all cases not necessary when examining the oesophagus. He employed a hypodermic of morphine hydrochlorate gr. $\frac{1}{6}$, and atropine sulphate gr. $\frac{1}{150}$ half an hour before examination, and careful anaesthetization with cocaine 5 per cent. and adrenalin solution 1 in 1,000, of the mouth, pharynx, and arytenoids. Except in a few cases of post-cricoidal growth, he found this method exceptionally satisfactory.

Sir STCLAIR THOMSON (London) could not support Mr. Waggett's plea for the abolition of the bougie, for in many years' practice he had never had any anxiety from the careful use of the solid bougie, and yet in his early days of oesophagoscopy he had had many moments of anxiety. Fortunately he had never had nor been associated with a fatal accident from direct examination, but one of his cases had alarming emphysema of the neck with damage to the cricoid cartilage. Therefore he thought that teachers should insist on the fact that oesophagoscopy was a much more delicate and dangerous proceeding than direct tracheoscopy. The seniors knew this better than others, for they had not had any one to teach them the manipulations in which they were now able to instruct others. Of course, once acquired, oesophagoscopy was a safe and sound procedure, and he should abolish the use of blind bougieing. But he would much rather have a bougie passed down his own gullet by a general practitioner of experience than allow a budding laryngologist to pass a Killian tube on him. Hence he agreed with the President in not being able to support Mr. Waggett's plea for the abolition of the gum-elastic bougie.

Mr. HERBERT TILLEY (London) thought that, while the mandrin was quite unnecessary in the hands of the practical oesophagoscopist, it would not be wise to deprive the beginner of its aid in enabling him easily to enter the upper regions of the gullet. To pass the metal tube into this region required considerable practice, and only by this could the beginner learn the amount of pressure necessary to overcome the resistance in the cricoid region; in his days of inexperience the mandrin would probably be safer than the metal tube. The speaker also thought that the olive-headed bougie was not entirely useless or to be discarded, for nothing so effectually cured cases of functional dysphagia as the passage of such an instrument. He was still inclined to regard the condition as a functional spasm of the musculature in the upper gullet; if not, how would Dr. Hill explain the sense of resistance and its sudden giving way to the bougie with complete cure of the dysphagia? He had had many opportunities of using radium in large doses and properly screened for malignant stricture of the gullet, but at the Radium Institute they had never seen a cure of any form of squamous epithelioma affecting the mucous membrane of any part of the alimentary tract, although very great relief to dysphagia followed the dilatation of, and insertion of the radium capsules into, the malignant stricture. Some of this relief was probably due to mechanical dilatation of the stricture. He sympathized with Dr. Mosher's view as to the value of general anaesthesia in the first examination of many cases of gullet stricture.

Mr. WAGGETT, in his reply, said he wished to emphasize the following points: (1) The blind passage of the bougie left the surgeon in ignorance as to the nature of the obstruction. (2) It was therefore desirable that at least one surgeon in every hospital should be able to make a genuine diagnosis, and be able to pass the oesophagoscope with safety through the healthy portions of the gullet. (3) It was unnecessary for diagnostic purposes to pass the instrument into and past the diseased area, and it should not be difficult to train students in this country, as was done in other countries, to pass the instrument with perfect safety, under direct visual control, to within a quarter of an inch of the lesion.

Dr. BROWN KELLY, in his reply, maintained that the obstruction at the cardia in so-called cardiospasm was due to spasm and not to paresis. This he had showed was caused either by abolition and inhibition of the cardia tonus or by the action of the autonomous nervous system in overpowering the dilator fibres of the vagus. In many cases of cardiospasm there was epigastric pain, but this was not essential. In his opinion cardiospasm did not imply violent contraction, but rather a condition approaching one of non-relaxation.

Dr. HILL, in reply, said that, according to observations with his deep pharyngoscope, Professor Kahler and others were wrong in describing the upper view of the closed mouth of the oesophagus as appearing as a slit. The partially closed post-cricoidal pharynx presented a transverse slit-like lumen during the passage of the endoscope, but the true closed mouth of the gullet appeared as a dimpled pucker or rosette. Professor Kahler's unfavourable impression gained by observing the results of Exner's applications of radium to malignant strictures he could well understand, as Exner's technique was different to that of Dominici, which had been carried out by himself (Dr. Hill) in conjunction with Dr. Finzi. Exner used radium salts enclosed in glass tubes, whereas their radium salts were enclosed in platinum screens of 2 mm. thickness, with an outer rubber covering 1 mm. thick. Moreover, there were other refinements of technique, so that the radium tube remained accurately in the cancerous area, so that no cauterization took place, as was probable, at all events, in Exner's earlier applications. Dr. Brown Kelly's very interesting experiments and observations on section of the vagi seemed to him to

support very strongly his (the speaker's) views that functional phreno-cardiac dysphagia was of the nature of atony, for Dr. Kelly showed that after section of the vagi the whole thoracic gullet was actually dilated—that is, atonic and paralysed—and it could scarcely be argued that the phreno-cardiac region was presumably in a state of spasm whilst the rest of the gullet was admittedly atonic. Those who loosely used the term "spasm" in a primary sense in reference to the gullet seemed to have no idea of what they were really postulating. They made no distinction between paroxysmal deglutitory spasmodic cramp and long-continued tetanus, and they did not appear to realize that primary spasm without subjective sensations presented great difficulties. Moreover, they made no distinction between hypothetical functional spasm and an alleged post-spasmodic anatomic contracture. Dr. Downie's 24 cases, recorded as "spasmodic," out of a total of no less than 100 cases of alleged gullet stricture, could not be accepted as unequivocal evidence, as the diagnosis had been made by the old blind and uncertain methods of investigation in most instances, and he doubted if any one of them would stand the test of expert endoscopic and radioscopic investigation, which was not extensively practised during the period when most of Dr. Downie's cases came under observation. Dr. Hill was firmly convinced that true primary functional dysphagia located in the gullet, whether paretic or spasmodic, was extremely rare and based on errors of observations and misconceptions on the anatomy and physiology of the gullet, more especially as regards the presence of sphincters. In answer to Mr. Tilley's remarks, Dr. Hill pointed out that the relief afforded by bougieing was no presumptive evidence of spasm, as that procedure would merely accentuate spasm, whereas bougieing admittedly relieved paresis by mechanical stimulation, and was the accepted treatment for the relief of soft inflammatory tumefaction, as well as for tighter anatomic strictures.

NOTES ON SOME CASES OF PAINFUL FISSURE OF THE MOUTH OF THE OESOPHAGUS.

By ADOLPH BRONNER, M.D.,
Bradford.

No part of the body has, up to a few years ago, been more neglected than the oesophagus. It was no man's land; the laryngologists did not trouble much about it; the surgeons neglected it. It is only since the introduction of the oesophagoscope that we have been able to get a more or less distinct view of the oesophagus; but even now our knowledge of its diseases is very deficient. It was Killian who in 1908 first carefully studied the upper part from an anatomical point of view. He proved that the lower fibres (fundiform plexus) of the cricoid-pharyngeal (lower constrictor) muscle, form a ring round the posterior and upper part of the oesophagus, which he calls "the lip of the mouth." He proved and demonstrated that this mouth is, in a way, similar to the cardiac orifice, that it can be opened or closed, and is generally in a state of tonic contraction. This is the spot where, on passing a bougie, we often find a resistance, more or less marked, where foreign bodies frequently lodge, where we find the opening of the oesophageal pouch; it is often the seat of cancer, and is naturally the spot where we should expect a traumatic lesion, from the passing of hard or irritating food. There is no doubt that we can get spasm (reflex or direct) of the mouth of the oesophagus, just as we get spasm of the cardiac orifice, generally of a more or less painful nature. We have all of us frequently seen cases of painful spasm of this region, which was probably due to a local ulcer or fissure, and which have lasted for months, even years, and have been permanently cured by the use of olive-shaped bougies. Often there was blood on the bougie, and we then suspected cancer or a syphilitic or tuberculous lesion. Of course, it was impossible to make an exact diagnosis before the introduction of the oesophagoscope.

I had noticed that the majority of these cases which came under my notice were women of 30 to 50 years of age, and that they often also had dry catarrh of the pharynx. I have only been able to follow up two cases, which had been carefully and frequently examined with the oesophagoscope. Some patients refused to be so examined, or at least more than once. Some are most difficult to examine.

CASE I.—Mrs. P., aged 30, saw me in August, 1911. She has had difficulty in swallowing for three or four years, which varies very much. There is not always much pain, but it is sometimes very severe, and generally a feeling of choking. Liquids can be taken more easily than solids. She has a dry feeling in the throat and nose, and has been hoarse for two or three months at a time. She looks ill and feeble, due, as she says, to being unable to take enough food. There was slight dry catarrh of the nose, pharynx, and larynx, with a few crusts. On examination with the oesophagoscope, I could distinctly see a small ulcer (fissure) partly covered with granulations. Ten per cent. argent. nit. was applied. I could not pass the tube, but succeeded in passing a fairly large olive-shaped bougie. There was a little blood on the bougie. I passed a larger bougie two or three times, and gave her a prescription for a menthol spray and iodine paint. In November I saw the patient again. She had been able to swallow very much better, but sometimes solids would not pass. I again examined her and found that the ulcer was distinctly smaller, and the bougie could be passed with greater ease. On December 24th the ulcer was only just visible. She can now swallow fairly well. She complains of the accumulation of wind "below the windpipe"—a common symptom, which is evidently due to spasm of the mouth of the oesophagus. I saw her again on July 22nd, 1912. She is perfectly well and can swallow anything. She refused to be examined as she says she is cured, and has been for some months. There is still some dry catarrh of the pharynx.

CASE II.—Mrs. H., aged 55, saw me at the hospital in December, 1908. She had not been able to swallow well for three years; often had much pain, which varied. A small ulcer was seen at the mouth of the oesophagus. Bougies were passed six times, and the dysphagia disappeared. On April 1st, 1909, the oesophagoscope was passed, there was no fissure visible. The patient can now swallow perfectly well. She called again, February, 1912. Has had dysphagia for two or three months. A small ulcer was again visible. Bougies were passed three times. There was slight atrophic catarrh of the pharynx. March 1st, no fissure whatever. July 22nd, she writes: "I think I shall have to come to see you as I cannot swallow so well again. I have not much pain, but my throat dries up and makes me feel queer."

In my opinion these have been cases of fissure of the mouth of the oesophagus similar to those recorded cases of fissure of the cardiac orifice. Possibly the dry catarrh of the hypopharynx may have been a predisposing cause, or possibly there may have been a small foreign body embedded in the mouth of the oesophagus. The following cases are evidently of a similar nature.

CASE III.—Mary W., aged 55, had lupus of the nose in 1909, which was scraped and cured. In January, 1911, she complained of dysphagia. A small ulcer and growth were seen on the lip; too small to remove. Bougie was passed. June: Can swallow much better. July, 1911: Perfectly well; no growth. She writes July 22nd, 1912: "We are pleased to report favourably. Mrs. W. is quite well and can swallow without pain both liquids and solids.

CASE IV.—Mrs. A. was seen in June, 1907. Not able to swallow well for two or three years. Refused to have the oesophagoscope passed, as the throat was very painful. Large bougie was passed with difficulty. Blood on the bougie. June 13th: Much better. June 27th: Perfectly well. Has not answered my letter of inquiry of July 10th.

CASE V.—Alice T., aged 50, was seen in September, 1911. Dysphagia three or four months, slight atrophic pharyngitis. The interarytenoid fold was slightly thickened. Lungs normal. The mucous membrane round the mouth of the oesophagus thickened and bleeds. No ulcer visible, but the patient was very difficult to examine. Bougies passed. October 5th: Large bougies passed and examined with the oesophagoscope. Normal.

CASE VI.—Florence W., aged 28. Seen May, 1911. Dysphagia for several years, and dry throat. General thickening of the mucous membrane round the mouth of the oesophagus, and small ulcer. Large bougie passed. May 18th: Much better.

CASE VII.—Walter S., aged 43. Had dysphagia for six months and dry throat. Well-marked atrophic pharyngitis. Could not pass oesophagoscope as teeth were too prominent. Difficulty in passing bougie. Blood on bougie. November 12th: Still dysphagia. Bougies were passed a few times. November 29th: Very much better.

I have brought these cases before you in the hope of eliciting the opinion of the members on this very important subject. Of course I know perfectly well that incipient cancer or a syphilitic or tuberculous lesion may give rise to similar symptoms. I know that many feel very strongly, that non-malignant lesions of the mouth are very rare.

Personally I think that non-malignant ulcers and

fissures of the mouth of the oesophagus are not uncommon, and that they are possibly in some way connected with dry catarrh of the pharynx.

SYPHILIS AS A CAUSE OF OESOPHAGEAL STENOSIS.

By WALKER DOWNIE, M.B., F.R.F.P.S.Glas.

IN this very short communication I wish to draw the attention of the members of this Section to the subject of syphilis as a cause of stricture of the gullet. Speaking offhand, one would say there is no reason why syphilis should not attack the gullet in common with other organs, nor is there any apparent reason why a stenosis of the oesophagus should not follow a specific inflammatory or ulcerative lesion of its walls. As a cause of stenosis of the gullet syphilis appears, however, to be systematically ignored. In my experience syphilis is rarely considered as a probable cause during the investigation of cases of oesophageal trouble, and many practitioners, I find, believe that the gullet is never the seat of a syphilitic lesion.

Dr. John M'Crae, in Osler's *System of Medicine*, says that "many authors deny that syphilis of the oesophagus occurs; this can scarcely be true, but the condition is certainly very rare. The cases described," he says, "rest mainly upon therapeutic evidence, namely, that after antisyphilitic treatment the apparent stenosis of the oesophagus had disappeared."

In my opinion there is no doubt about syphilis being the cause of stenosis of the gullet in a fair proportion of cases; and further, I think that that structure is affected by syphilis much more frequently than is generally supposed. I have long held this opinion, and have had the opportunity of demonstrating cases of this nature on several occasions. While the diagnosis may be verified by therapeutic means, it rests largely, in my opinion, on other grounds.

Recently I published a paper under the title of "Remarks based on the Analysis of 100 Consecutive Cases of Stricture of the Gullet." In that series 11 cases were due, in my opinion, to a lesion caused by syphilis. Syphilis of the gullet, in my experience, is chiefly met with in women. Of the 11 cases which occurred amongst the 100 cases just referred to 9 were in women, and as there were 63 women in the 100 cases, we have syphilis as the determining cause of the stenosis in a fraction over 14 per cent. A married woman who has had the misfortune to be syphilized by her husband, has neither knowledge nor suspicion of the nature of the illness, and too often she considers it to be a concomitant part of the married state. For these reasons she does not seek treatment until her system is deeply saturated with the disease, and her health has become seriously impaired.

The absence of appropriate treatment in the early stages I believe to be one of the chief reasons explanatory of the fact that cases of syphilitic stenosis of the gullet occur so much more frequently in women than in men.

The patient with syphilitic oesophageal stricture is anaemic, thin, and feeble, and the pale skin has usually a tinge of yellow. Frequently there are fissures at the angles of the mouth, which she will probably tell you have been there for months or years, and these fissures are usually accompanied by a chronic superficial glossitis, with recurring attacks of sore mouth, indicative of increased activity at intervals in the inflammatory process as it affects the tongue. Of course, neither fissures at the angles of the mouth, nor a chronic superficial glossitis, are necessarily syphilitic lesions, but when those are present the possibility of syphilis being the cause should be carefully investigated.

In these cases there is the further story of difficulty in swallowing, sometimes painful, though usually devoid of pain, and this difficulty is accompanied by a slow, but steadily progressive, emaciation, and later by considerable physical exhaustion. On further inquiry you may get a clear history of the presence in the early period of her illness of the signs indicative of the secondary stage of syphilis, with, in many cases, a subsequent history of miscarriage, etc. There may be scars in the upper respiratory tract which mark the site of some healed tertiary lesion. But in my experience scars in the fauces and pharynx, and other structural losses in the palate, fauces, pharynx, or in the nose, caused by syphilis, are but rarely met with in cases where stenosis of the gullet is present. The diagnosis may be further confirmed in some instances by employing Wassermann's method of testing the blood for syphilis. This should be done before any form of antisyphilitic treatment is employed, for after treatment has been pursued for some time the result of such an examination may be negative, and the conclusions based upon this finding may be misleading.

Direct examination by means of the oesophagoscope, while it enables one to make a careful inspection of the affected area and to obtain information regarding the condition of the mucous membrane in the neighbourhood of the stricture, is not of any great service in the differentiation between the stricture resulting from syphilis and a fibrous or cicatricial stricture from any other cause.

In the early stage we may have, as Dr. Kahler has said, a deep lividity of a limited area, and there may be a yellowish coloration of the mouth surrounding the dull red area.

As illustrative of my contention that syphilis is a cause of serious stricture of the gullet, and that much can be done to remove the stenosis which threatens starvation, I shall quote particulars of one case which is fairly typical of most of the other cases I have had under my care.

The lady, 33 years of age, complained of difficulty in swallowing. This she had suffered from for between four and five years, during which time she had never been free from pain during the act of swallowing, and she had difficulty in the taking of fluids as well as of solids. Her food had consisted of soups and milk preparations, and she could not remember when she had last swallowed any flesh meat, it was so long ago. She had been married for nine years, and her first pregnancy had terminated in a miscarriage, due, she had thought, to the state of her health, although until after her marriage she had not known what ill health was.

She was anaemic in appearance, with a tinge of yellow in the skin, and she weighed 7 st. 2 lb. only when fully dressed. She had fissures at the angles of her mouth, with a glazed and tender tongue, indicating a superficial glossitis.

On examining the gullet with a bougie, a stricture was discovered at a distance of 7¼ in. from the upper gum, through which, with gentle pressure, a No. 7 bougie was passed. Treatment was prescribed, under which she improved satisfactorily. Her home was at a considerable distance from Glasgow, and I did not hear of her until three years had passed, when she again called on me. She was then in an enfeebled, emaciated condition. She had been unable to continue treatment in the interval as advised, and the difficulty in swallowing had returned, and was slowly increasing.

On examining the gullet a No. 3 oesophageal bougie was the largest size which could be passed through the strictured area.

She was placed in a nursing home, where the treatment consisted of vigorous inunction with mercurial ointment, the administration of potassium iodide, combined with pepsin, regular and progressive dilatation of the stricture by the passage of bougies, and feeding by stomach-tube and otherwise.

At the end of three months she gained 1 st. 12 lb. in weight, and in general appearance she was marvellously improved. And now after a lapse of close on three years she is exceedingly comfortable and in good health.

The importance of recognizing syphilis as a cause of oesophageal stricture cannot be exaggerated, for the majority of the cases due to this cause are amenable to treatment, and most of them can be cured; and this fact is my excuse, if excuse be necessary, for bringing the subject of this paper before you.

DISCUSSION.

Dr. WILLIAM HILL (London) was not convinced that Dr. Downie's claim of having observed 11 cases of syphilitic contractions of the gullet out of a total of 102 patients diagnosed as oesophageal stricture could be accepted as a conclusive record. Most of the cases came under observation many years ago, when Dr. Downie, in common with others in this country, had not realized the practicability of Mikulicz's method of oesophagoscopy. In over 180 cases of gullet disease, excluding foreign bodies, examined by endoscopy and radioscopy, he (Dr. Hill) had only observed one undoubted case of syphilis—a gumma on the deep pharynx involving the mouth of the gullet. Guisez had only seen one syphilitic stricture in over 800 gullet cases, and unequivocal records of such instances, verified either *post mortem* or by modern methods, were extremely scanty. He hoped Dr. Downie

would see his way to demonstrate the condition with the oesophagoscope in one or two patients before one of the laryngological societies at an early date. It would be interesting to know in how many of these alleged syphilitic strictures the lesion was behind the cricoid plate and therefore not, strictly speaking, oesophageal.

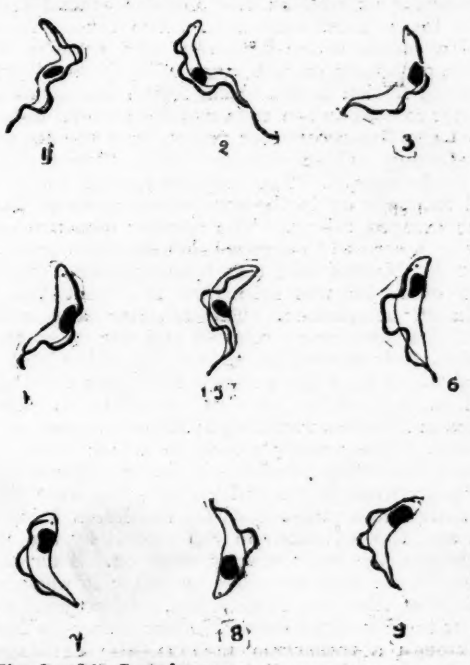
Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

ON THE PRESENCE OF POSTERIOR NUCLEATED PARASITES IN A STRAIN OF *T. BRUCEI*.

(From the Runcorn Research Laboratories.)

While carrying out some experiments on the degenerative changes undergone by trypanosomes in the cadaver of the animal host, it was observed that in the blood of a rat which had been inoculated for the purposes of the experiments with the strain of *T. brucei* (Uganda), some of the short, stumpy forms of parasite presented a position of the nucleus posterior to the centre. The strain employed was obtained from Sir David Bruce in September, 1910. In consequence of this observation the films taken from the laboratory animals employed for carrying on this strain and for experimental purposes during the period that the



Figs. 1 and 2.—Long forms.
Figs. 4 and 5.—Short, stumpy forms.
Fig. 3.—Form with nucleus slightly posterior to centre.
Figs. 6, 7, 8, and 9.—Forms with nucleus posterior.

strain has been kept going in the laboratory were examined carefully and searched for parasites presenting this peculiarity in the position of the nucleus. As a result of this examination it was found that not only in rats, but also in rabbits and guinea-pigs, such forms appeared, usually in small numbers. The figure shows to what extent the nucleus is displaced posteriorly in various instances in films from the blood of different animals. In no case so far has the nucleus been observed in these preparations to lie actually posterior to the blepharoplast, but in many instances it approaches very closely to the blepharoplast.

Liverpool. B. Blacklock, M.D.

LARGE DOSES OF CALOMEL IN DIARRHOEA.

For over twenty-five years I have observed the results of the treatment of diarrhoea by means of the administration of calomel, and have found that in every case in which the remedy was promptly and efficiently employed the result has been recovery. In this complaint large doses of calomel are tolerated without ill effect, and I have found that the drug is sufficient for the purpose without opium. It is best exhibited as a powder, because in the form of pills or tablets it is less satisfactory. Infants have borne the drug in much larger doses in proportion than adults. For a long time I had considerable difficulty in the administration and retention of the powder in cases in which vomiting was a complication. I discovered that cerium oxalate, combined in equal quantities with the calomel, at once overcame the vomiting and secured the retention of the drug. Mercury perchloride suggested itself owing to its greater convenience of administration than the powders, but it did not produce the same satisfactory result.

In mild cases of diarrhoea I have found small doses of calomel to be sufficient, but in serious and obstinate attacks I have been compelled to the conclusion that larger doses are indicated—so much so that I regard it as an aphorism that if calomel fails to cure diarrhoea it is because the dose is insufficient. I have tested the use of calomel in heroic doses, and in this complaint have never observed any untoward effects. For adults I prescribe 5 grains, together with 5 grains of cerium oxalate, to be taken every two hours, and find that six of the powders, and sometimes less, are sufficient to control the attack. To children, of no matter how tender an age, I prescribe 2 grains of calomel with 2 grains of cerium oxalate every two hours until the symptoms subside.*

I have also tried calomel in the diarrhoea of typhoid fever; 2 grains night and morning give good results. Though I cannot say that calomel will cure typhoid, if given in the early stages it greatly mitigates it. One precaution is very necessary—never to give it if the bowels be confined, as they often are. Magnesium sulphate combined with potassium bicarbonate should then first be given, or salivation is almost certain to occur. There is usually great diffidence in giving purgatives in typhoid fever, but I have never seen any harm result from this combination in moderate doses, and continued until the bowels are relaxed; it should on no account be given in one large dose. I have never known a case to end fatally that had been submitted to this treatment in the early stage of the disease.

Calomel is also of great value in the wasting condition of children from gastro-enteritis due to bad feeding, but only where tubercle is absent. One grain of calomel given night and morning, together with proper feeding, has been the means of restoring many infants where other modes of treatment have failed, including hydrarg. c. creta, which I have found absolutely useless.

It is well known that calomel disinfects the alimentary tract, but, in addition to this, it is supposed to increase the flow of bile from the liver. I believe, after a long and careful investigation, that the flow of bile following the use of mercury does not depend upon increased action of the hepatic cells, but that the drug has the power of removing the mucus which has obstructed the biliary passages, and thus permits the flow of bile which has accumulated in the liver itself. It has often been told me, both of adults and children, that 1 grain of calomel taken at bedtime has produced sleep—a report which has led me to speculate as to whether the liver plays any physiological part in the production of sleep.

Bradford, Yorks. W. E. Fellowes, L.R.C.P. and S.Edin.

EXCESSIVE INGESTION OF SALT PRODUCING OEDEMA.

Dr. Bain's memorandum in the British Medical Journal of October 5th, 1912, page 880, interested me very much. I am indebted to my friend Dr. Ackerley of Llandrindod for having first forcibly called my attention to the subject of excessive salt eating. I have had a case of exophthalmic goitre under my care for over a year, and on the whole she has done well under treatment by means of continuous counter-irritation (Lebenswecker method). She, however, suffered from extensive oedema. I showed her at a meeting of a medical society, and the members were inclined to attribute it to cardiac weakness; nevertheless it was acknowledged that oedema was often seen in exophthalmic goitre quite apart from heart or kidney disease. No one suggested salt-eating as a cause. A short time ago the patient's sister told me she ate large quantities of salt. I asked her to stop this, and

* Messrs. Hough, Hoseason and Co., of Manchester, prepared the powders in the form of tablets, which are readily dispensed and easily crushed into powder.

since then the oedema has greatly lessened. Patients who are very fond of highly salted food often refuse to give it up. I know of several such who have puffy eyelids and slight oedema of the feet, especially at the end of the day.

Bournemouth. W. J. MIDELTON.

Reports of Societies.

MANCHESTER MEDICAL SOCIETY.

Wednesday, October 2nd, 1912.

Dr. E. S. REYNOLDS, President, in the Chair.

Classification of Dysmenorrhoea.

DR. W. E. FOTHERGILL (Manchester) submitted a way of explaining and arranging the varieties of dysmenorrhoea, which, he said, occurred (*a*) as a complaint of healthy women, and (*b*) as a symptom of various abnormal conditions. Women whose reproductive life was perfectly normal could have (1) the sharp pain known as spasmodic dysmenorrhoea, (2) the dull, aching pain known as congestive dysmenorrhoea, or (3), as was often the case, a mixture of the two. Uterine contractions went on throughout reproductive life, but were most active during pregnancy, during parturition, just after parturition, and during menstruation. Painful contractions during menstruation might well be called "menstrual pains," and regarded as not less compatible with perfect health than "labour pains" and "after-pains." Pelvic congestion was a normal feature of menstruation. If sufficiently pronounced, it was always associated with pain; and in many women produced it without any departure from health. In spasmodic dysmenorrhoea there were two factors—the violence of the uterine contractions and the sensitiveness to pain of the nervous system. In congestive dysmenorrhoea there were also two factors—the degree of pelvic congestion and the sensitiveness of the nervous system. Thus one factor was common to the two conditions, and this explained the fact that many healthy women suffered from a mixture of spasmodic and congestive dysmenorrhoea. For the woman whose brain received into consciousness menstrual contractions in the form of "menstrual pains" would also recognize menstrual congestion as pain. Persons specially sensitive to pain were by no means to be confused with neurotics. The latter complained every day of their lives, while the former only complained when in pain—as, for instance, during menstruation. As to the treatment of spasmodic dysmenorrhoea by dilatation of the cervix, the child's head was the best dilator, and there was no use in dilating the cervix for dysmenorrhoea in parous women. This treatment was also quite useless in cases of pure congestive dysmenorrhoea. As a symptom of abnormal pelvic conditions, both spasmodic and congestive dysmenorrhoea were common. This symptom was not much use from the point of view of the diagnostician; its presence had little bearing upon the treatment of the causal condition. It must be relieved by the usual analgesics, as must dysmenorrhoea in healthy subjects.

Lacrymation.

Mr. BRADBURNE, in a paper on lacrymation, asked if the source of stimulation in eyestrain could not be found in the nature of the aqueous fluid, and referred to the work of Pfeffer and Albricht on the toxicity of urine in cases of *petit mal* and chorea. He closed with a warning against the use of probes in epiphora, and quoted Hirschberg as saying, "These methods never do what they are intended; they only demonstrate what sick people will stand and what the sick body will stand in the way of ill-treatment."

Slow Pulse.

Dr. CHARLES MELLAND recorded three cases of slow pulse, illustrated by polygraph tracings, the analysis of which showed that in each case the nature and cause of the slow pulse were different. Only one of the cases (a young man aged 22 with a perfectly healthy heart) was a true bradycardia, in which all the chambers were beating slowly. His pulse was 40 per minute, and he had a well-marked "H" wave, as in other cases of sinus bradycardia. A second case, with a rate of 36, was one of incomplete heart-block, with the ventricles beating only half the rate of the auricles. This was in an elderly man with aortic disease and a history of syphilis, but with none of the syncopal attacks of the complete Stokes-Adams syndrome. The third was a patient with ulcerativa endocarditis, with a pulse of 45, whose tracings showed a heart-rate of 90, every alternate beat being a regularly recurring extrasystole, whose impulse could not be felt at the wrist.

ROYAL SOCIETY OF MEDICINE.

SURGICAL SECTION.

Tuesday, October 8th, 1912.

Mr. G. H. MAKINS, President, in the Chair.

Injury of the Semilunar Cartilages.

Mr. A. J. WALTON, in a paper on injury of the semilunar cartilages, said this injury occurred when the knee was in a position of full extension, not in the position of semiflexion and eversion as usually described. The two semilunar cartilages represented the remains of an interarticular cartilage, the central perforation of which had increased in size until only a circumferential band was left. The under surface of the femur was flat, so the internal and external lateral ligaments were tense in full extension of the knee. The posterior crucial ligament was attached further forwards on the femur than usually described, so the posterior as well as the anterior crucial ligament became tense in full extension. The crucial ligaments formed a couple which kept the joint surfaces tightly together, especially on the inner side, during the movement from flexion to extension. At the end of extension the femur rotated on the tibia and the anterior end of the internal semilunar cartilage passed over the edge of the tibia. During sudden extension the anterior part was liable to be caught. The anterior end of the external passed forwards on to the non-articular area of the tibia, and so escaped injury. The speaker demonstrated his theory by a series of diagrams and dissected joints. Mr. ALBERT M. MARTIN said that from a personal experience of 449 cases he was sure that the joint was in a position of semiflexion. The anterior and posterior crucial ligaments were relaxed and the joint surfaces separated; this allowed lateral mobility of the knee. The internal rather than the external semilunar cartilage was caught, as the accident was an inward twist. The percentages in his cases was 92 to 8; 282 of his cases occurred in miners. The narrow places in which they worked precluded full extension of the knee. A large number of his cases occurred in football players, who were liable to twist their knees whilst dodging, the knees being semiflexed, and the feet fixed in the ground by the leather studs whilst the body weight went on. Some 95.5 of his cases were definite splits or tears; it was rare for the whole cartilage to be detached. Subsequent attacks were due to very slight causes. After thirty-six hours in bed, through a transverse incision, the cartilage was removed. He used no splints, and allowed the knee to be moved as soon as the patients could bear it. They were discharged on the tenth day. Mr. MCADAM ECCLES agreed with Mr. Martin as to the position of the joint at the time of the accident. The weight of the body came on the internal condyle accompanied by an inward twist. The cartilage was nipped by the weight of the body falling on the internal condyle with the knee twisted inwards. For the first dislocation he advised the application of a plaster for one month, followed by massage to the joint and muscles. For subsequent attacks he removed the cartilage through a curved incision. Mr. BERRY thought that to obtain a good result the operation should be done rapidly. It should be completed in six minutes.

CLINICAL SECTION.

AT a meeting on October 11th, Sir WILLIAM OSLER, Bart., President, in the chair, the following were among the exhibits: Mr. H. MORRISTON DAVIES: A case in which *Arterio-venous anastomosis* had been performed after gangrene due to syphilitic endarteritis in a man aged 47. In June, 1911, the middle toe of his left foot had been amputated for gangrene, but the wound failed to heal. Fresh gangrenous patches developed, the foot was cold and

painful, and there was some purple discoloration. For this an arterio-venous anastomosis was done in Hunter's canal in August, 1911, the proximal end of the superficial femoral artery being joined to the peripheral end of the femoral vein and the proximal end of the vein and distal end of the artery ligatured. When shown, fourteen months after, there was no pain, discoloration, or oedema. Dr. A. E. Gow (for Dr. W. P. Herringham): An *Unusual rash* in two brothers aged 5 and 2 respectively. The rash first appeared when the children were only a few months old. First a papule appeared, then a black crust formed in the centre, next a circular crateriform ulcer developed, and finally, in about two or three weeks, the lesion healed, leaving a scar like a vaccination mark. There was a fusiform swelling of many of the interphalangeal joints of the fingers. The lesion was possibly a tuberculide. The President: A girl, aged 20, showing *Circulatory disturbance with cervical rib*. After using the muscle of the right hand for a few minutes the skin of the arm reddened, the arm swelled, the right radial pulse became smaller, the blood pressure fell from 115 mm. of mercury to 90, and the veins in the neck enlarged. Later the arm became numb and useless. The President had described a group of cases to which this belonged. Dr. F. Parkes Weber: *Calcinosis* of the subcutaneous tissue in a girl aged 7. Many subcutaneous nodules, most of them smaller than a pea, were present. Some, much larger, had been formed by coalescence of smaller ones. A few had softened. Microscopical and chemical examination had shown that they consisted of phosphate and calcium carbonate. Dr. H. Batty Shaw and Mr. Percy Hopkins: A boy, aged 7, showing (*a*) double-jointedness, (*b*) dermatolysis ("elastic skin") with great friability of the skin and tendency to bruising, and (*c*) multiple subcutaneous tumours of the limbs (? fibromata or neuromata). Mr. Lawrie H. McGavin: Two cases of successful *Excision of the rectum for carcinoma* by the abdomino-perineal method. In each case a transverse colostomy had been done, and in one, a woman aged 67, most of the operation had been performed under spinal analgesia. Also, among other exhibits, an apparatus devised for exerting extension on the fragments in cases of fractures in the length of the tibia. Mr. Paul Roth: *Traumatic myositis ossificans* on the front of the thigh of a carman, aged 54, following kick by a van-horse. Dr. F. E. Batten: A man, aged 43, showing *Tremor* of all four limbs. It was present during rest, but increased by movement and under observation, when it became very violent. He regarded it as functional

GLASGOW MEDICO-CHIRURGICAL SOCIETY.

At a meeting on October 4th, Dr. Freeland Fergus, President, in the chair, the following were among the exhibits: Professor Robert Kennedy: (*a*) A child aged 4 years, who, when 2 months old, was operated on for a *Birth paralysis* affecting the whole of the left arm. The lesion found was a band of cicatricial tissue encircling the juncture of the fourth and fifth trunks of the brachial plexus. Function was now very largely restored. (*b*) A man aged 30, in whom a *Dislocation* of the left shoulder in December, 1911, was followed by paralysis of the arm. At the operation in April, 1912, the trunks of the brachial plexus were freed from cicatricial adhesions. Function was now practically restored, and the arm, which had been much wasted, measured only slightly less than the other. (*c*) A man aged 32, who in November, 1911, sustained a *Fracture of the vault* of the skull on the left side, followed by paralysis of the right arm. In June, 1912, a cicatrix and some spicules of bone were removed from the cerebral cortex, and within twenty-four hours power of voluntary movement was restored. (*d*) A child aged 7, who, from the age of 1 year, had had paralysis of the right leg and foot resulting from an acute *Anterior poliomyelitis*. The operation of tendon grafting performed in May, 1912, had given the child a perfectly satisfactory limb. Professor W. K. Hunter: (*a*) A woman aged 39, suffering from *Sclerodermia* with calcareous deposits in the subcutaneous tissues of the fingers. The illness began at the age of 14, with phenomena of Raynaud's disease. When 18 she had pains in the joints, and began to suffer from tightness of the skin of the fingers. Three years later nodules appeared about the finger-joints, some of which broke down, exposing calcareous material. The hands and feet, face, arms, and gluteal regions were the parts affected by the sclerodermia. Treatment by injections of fibrolysin for the past two months appeared to be doing good. (*b*) Blood films from a case of *Infantile leukaemia*. The patient, a girl aged 2½ years, died in Glasgow Royal Infirmary after an illness of about two months' duration, characterized by gastro-intestinal disturbances, anaemia, epistaxis, and marked enlargement of liver and spleen. Blood examination a few days before death showed haemoglobin 30 per cent., red blood corpuscles 1,460,000, white blood corpuscles 4,400 per c.cm. Differential leucocyte count showed 13 per cent. polynuclears, 5.5 per cent. large lymphocytes and transitionals, 81.5 per cent. small lymphocytes. Mr. G. H. Edington described 2 cases of spina bifida presenting unusual features: (1) A female infant, aged 4 months, with large cervical *Meningeal lipoma*, in the deeper part of which was felt a movable piece of bone. A skiagram confirmed this and showed defective closure of the neural arches of the second and third cervical vertebrae. There was at operation no bulging of the meninges, which were plainly seen through the gap in the bones. (2) A female, aged 4 months, with very large *Meningo-myelocele*, forming a cystic swelling over the right innominate bone. The lower limb was everted and held extended. On tapping, 18½ oz. of cerebro-spinal fluid were withdrawn, and a finger detected a gap in the right laminae of the lumbo-sacral region. Removal was followed by death within twenty-four hours. *Post-mortem* examination showed scoliosis of the lumbar spine with concavity to the right. The sacrum was displaced forwards and upwards in front of the fifth lumbar vertebra, which projected into the spinal canal. The left laminae were well developed, but the right were rudimentary. The protrusion had occurred beneath the gluteus maximus, stretching the muscle and accounting for the position of the lower limb.

ASSOCIATION OF REGISTERED MEDICAL WOMEN.

The annual meeting was held on Tuesday, October 1st, at 8 p.m. The minutes of the previous meeting having been read and confirmed, the officers and committee for the ensuing year were elected. Dr. Constance Long was re-elected President, Dr. Mary Murdoch Provincial Vice-president, Miss Aldrich-Blake Treasurer. The Secretary's report dealt with the Insurance Act and with the question of a State service for medical women in India. The deaths of Drs. Jex-Blake, Appel, Colley, and Pailthorpe, four members of the association, were recorded with regret. The Treasurer's report stated that the Benevolent Fund, the object of which was to assist necessitous medical women who were former or present members of the association, now amounted to £40. Miss Thorne and Miss Chadburn were elected administrators of this fund. A further amount was voted from the surplus money of the association to be added to the Benevolent Fund. At 8.30 p.m. a reception was held, after which the meeting was addressed by the President, Dr. Long, who gave an account of the present position of the British Medical Association with regard to the Insurance Act. Dr. Sheppard then moved the following resolution:

> That this meeting protests against the unjust imprisonment of Mr. Mark Wilks for the non-payment of taxes on his wife's income, over which he has no legal control, and which taxes he is unable to pay, and calls upon the Government to release him immediately, and further to amend the law in the interests of married people so as to make the income of husband and wife separate for the purpose of taxation.

Dr. Sheppard said that Mrs. Wilks was an honoured and respected member of the medical profession, and was sacrificing herself in the interests of all women; she therefore urged the meeting to carry the resolution as a mark of sympathy and encouragement to Mrs. Wilks. The motion was seconded by Dr. Murray, and, after a prolonged discussion, was carried with only two dissentients.

Reviews.

THE I.K. TREATMENT OF TUBERCULOSIS.

THE work of Dr. Carl Spengler of Davos, although doubtless familiar to all students of tuberculosis, is probably less well known to the general profession in this country, and hence the recently published account of it by one of his English disciples will be welcomed.[1] Dr. FEARIS occupied himself for several months in Dr. Spengler's laboratory in obtaining a thorough insight into the practice and results of the so-called I.K. treatment and the theories upon which it is founded. I.K., it may be premised, stands for *Immun Körper* (Immune Substances) contained in the blood of animals which have been injected with living tubercle bacilli and other micro-organisms into their muscular tissues. These tissues being endowed with a high degree of natural immunity, it follows that the blood of the injected animals possesses marked properties of lytic antitoxic action. The blood is collected, acidified, sterilized, and diluted according to instructions, and a further dilution must be made in varying degree according to the circumstances of the case for which it is to be used. Dr. Spengler's contention has always been that the immunizing substances are contained in the red blood cells, and that the serum derives them from that source. The more healthy the corpuscle, the more resisting power it possesses against tubercle and other forms of micro-organic poison. The capacity of these red cells to respond to the stimulus of tuberculin determines the success of that form of treatment, and the same may be said for open-air treatment also.

Dr. Spengler's main object has been to produce a method which should be less dependent upon the capacity of the patient's own cells, but should have independent powers of lysis upon micro-organisms and antitoxic effects upon their results. He claims to have succeeded in these objects, but success depends entirely upon the method in which his system is employed. Dr. Fearis's account of Spengler's views is very full. In many respects they are original. He lays a good deal of stress on the essential variety of the two forms, the long and the short, of the human tubercle bacillus, and discusses their relation respectively to the bovine form. The question of mixed infections is also dealt with in rather dogmatic fashion.

Turning to the more practical sections of the work, it will be found that a large measure of success is claimed for the I.K. treatment, not only in Dr. Spengler's hands, but in those of many other observers, and it may be assumed that Dr. Fearis has been duly impressed thereby if one may judge from the enthusiasm of his advocacy. It would appear, however, that several highly-qualified pathologists have come to a different conclusion and have expressed the opinion that the I.K. fluid is entirely inert. Such a conclusion can only be explained, according to the writer, by assuming that improper methods of administration have been employed. Much space is occupied in the book in controverting this criticism, and many illustrative cases are quoted to prove its futility. A tone of confident assertion prevails throughout the whole work, and the behaviour of the blood is assumed to be fully known. The only positive facts, however, that would appear to be really known are summed up as follows: The tubercle bacilli often disappear from the sputum, sometimes rapidly and sometimes only at intervals, while many of them appear to be undergoing disintegration by the breaking down of their capsules. While these microscopic changes are observed the patient's general health and well-being tends to improve, and the statistics quoted go to show that the rate of improvement is higher than under any other form of treatment. Similar claims have been made for other methods in times past, but Dr. Spengler's system rests upon a foundation of careful observation and scientific reasoning, and as such deserves the attention of those to whom it is not yet familiar.

[1] *The Treatment of Tuberculosis by means of the Immune Substances (I.K.) Therapy.* An introduction to Carl Spengler's work on Immunity and Tuberculosis. By Walter H. Fearis, with a foreword by Dr. Carl Spengler. London: John Murray. 1912. (Demy 8vo, pp. 226. Price 6s. net.)

INTERNAL SECRETIONS.

PROFESSOR SWALE VINCENT, in his volume entitled, *Internal Secretion and the Ductless Gland*,[2] has given us a valuable summary of the present position of knowledge.

As Professor Schäfer says in the preface, almost all we know regarding the internal secretions is the product of the last twenty or twenty-five years. Now the subject requires more than 400 pages even for a concise digest of the accumulated facts and some 3,000 references to deal with the literature.

In regard to the pancreas, Professor Swale Vincent takes the view that "the islets of Langerhans are not organs *sui generis*, but are an integral part of the pancreatic tissue." It is an extraordinary thing that this question should be so debatable. We find men of the highest acumen ranging themselves on either side. Professor Swale Vincent records, but gives no explanation of the fact, that islet tissues may be found as a separate lobe in certain fish. The difference in the circulatory supply is not a convincing proof of difference in nature, for the appearance of the capillary network would naturally alter in the shrunken exhausted alveoli which are supposed to form the islets. "As to whether the temporary structural modification of alveolus into islet tissue corresponds to a specialization of function, the evidence," he says, "is at present inconclusive."

In the chapter dealing with the kidney the author mentions the experiments of Rautenberg, who tied up the ureter of one kidney for three weeks and then opened it and excised the other kidney; the animal suffered from albuminuria, high blood pressure, and other signs of nephritis. At the autopsy extensive arterio-sclerosis was found. This brings to mind certain experiments of Carrell and Guthrie on the transplantation of both kidneys in cats, wholly successful in so far that the normal secretion of urine continued in the preliminary stage, but finally resulting in death with, in one or two cases, generalized arterio-sclerosis. There is some evidence that the serum of guinea-pigs injected with rabbit kidney emulsions are nephrotoxic to rabbits, giving rise to albuminuria and anaemia.

The chapter on the reproductive organs contains the results of recent researches by Marshall and others which are of very great interest. Castration before puberty entails the non-development of the secondary sexual characters, but "the penis does not share in the atrophy, so that in Eastern countries it is frequently considered necessary to remove this as well as the testes; the condition produced by castration is infantile, not female." Division or ligature of the vas produces none of the effects of castration, although the spermatogenic tissue degenerates. It is concluded, therefore, that the interstitial cells produce the internal secretion. Castration prevents the development of antlers in stags, but not of horns in animals where both sexes possess them. The thickened pad on the first digit of the spring male frog does not develop after castration, but does if pieces of testis are introduced into the dorsal lymph sac. In females removal of atrophy of the ovary leads not only to disappearance of secondary sexual characters, but in some to appearance of male characters. The cells of the ovary produce an internal secretion which causes menstruation and heat. The corpus luteum is essential for the attachment and development of the embryo in the first stages of pregnancy, and for the development of the mammary glands. Lané-Claypon and Starling's pronouncement that the fetus furnishes the hormone for these glands has not received confirmation; it is the corpus luteum. Ovarian grafts give good results, inducing heat, etc., but the efficiency of ovarian medication is regarded as unproven. The activity of the corpus luteum as a drug demands investigation.

In dealing with the adrenal glands the author gives an excellent account of their comparative anatomy and the developmental history of the cortex and medulla, which are separate organs in elasmobranch fishes, and of the inter-renal body and the chromophil bodies or paired suprarenals. He also portrays the abdominal chromophil body and the chromophil tissue, which stands in close

[2] *Internal Secretion and the Ductless Gland.* By Professor Swale Vincent. With a preface by Professor E. A. Schäfer. London: Edward Arnold. 1912. (Demy 8vo, pp. 464; illustrations 96. 12s. 6d. net.)

relation to the sympathetic ganglia of mammals; together these make up the additional adrenal medullary substance, the existence of which may explain the persistence of life in some animals after total removal of the adrenals. In the discussion on adrenin we note that the arterial degeneration which can be produced experimentally by successive doses cannot be attributed to the effect of mechanical strain from high blood pressure. It is a nutritive effect. In this respect we may mention the recently published experiments of Carrell by which he proved that a piece of artery or vein grafted into the abdominal aorta of a bitch served all the functions of an artery for four and a half years—the bitch pupped several times—and yet the artery was composed of nothing but connective tissue; no muscle and no elastic tissue was left within it. Wiggers brings evidence to show that in using adrenin as an injection to stop haemorrhage, it should be injected in small doses (0.01 to 0.075 mg.) and the blood pressure carefully watched. Large doses increase the haemorrhage as an initial effect. Evidence has been afforded by Cannon that emotional disturbances causes adrenin to be secreted into the blood. Exhaustion of adrenin may be one of the chief causes of fatigue after emotional excitement. The relation of cortex to medulla and the relative importance to life of each part has not been elucidated, and Professor Swale Vincent is inclined to regard the cortex as of equal, even if not of higher, importance than the medulla. Certain cases of tumour of the adrenal cortex, and likewise of the pineal gland or parts of the brain involving the pineal gland, are associated with extraordinary precocious development of the sexual organs and gigantism. Professor Vincent takes the view that the thyroid and parathyroid form parts of one whole apparatus, and probably the pars intermedia of the pituitary body may be added as a third constituent. The structure of one merges into that of the other. "Removal of the thyroids only may sometimes give rise to nervous symptoms (tetany), while removal of the parathyroids only may occasionally cause chronic symptoms (cachexia)." It may be supposed that the function of the internal secretion is to prevent poisoning by the products of body metabolism, or by infections from without. Hence the varying effect of removal on animals. Major McGarrison's important researches on endemic goître and tetany, which support this view, are very well summarized. Asher and Flack's experiments, which afford evidence that the internal secretion of the thyroid is under the influences of the laryngeal nerves, are noted. In the case of the pituitary gland Cushing's claim that a fatal cachexia hypophyseapriva is produced by extirpation is negatived by the recent experiments of Horsley. One of Horsley's monkeys lived in good health for nearly four months, and was then killed and found to have been totally deprived of pituitary. The whole question remains open. The active blood-pressure raising and diuretic substance is definitely allocated to the posterior lobe of the gland, which consists only of neuroglia cells.

Enough has been said to indicate the interest and importance of this work, which affords the physiologist, the pathologist, the pharmaceutist, and clinician a most useful account of the chief researches on this subject, which equally interests them all. We have noticed a few errors which might have been avoided by more careful proof-reading, and, admirable as is the matter, we cannot express the same opinion as to the style in which the author writes.

DIGESTION.

IN Professor ABDERHALDEN'S *Synthese der Zellbausteine in Pflanze und Tiere*[3] is contained an account of recent progress in our knowledge of the process of digestion, and more particularly of the work carried out by the author himself and his co-workers. He strongly advocates the view that digestion consists essentially of a gradual breaking down of the complex foodstuffs into simple constituents, or "Bausteine," comparatively few in number, which are absorbed as such, and thereafter synthesized by the animal cell into the characteristic cell constituents. Whatever be the nature of the carbohydrate introduced, most evidence points to the fact that the "Bausteine"—the form in which it is ultimately absorbed—is dextrose. At the same time, Weinland has shown that if saccharose be injected into the blood stream, although the greater part of it is excreted, yet the plasma becomes capable of inverting it. This may be taken to show that some ferment has been elaborated capable of dealing with, and destroying, the foreign substance. In the case of fats, the "Bausteine" are glycerol and fatty acids—amino-acids in the case of proteins. It is further shown that the older view that iron can be absorbed only when combined in an organic complex is untenable. Introduced in this form, iron is set free in the intestine in the ionic condition, and probably all inorganic substances are absorbed in such a state. Feeding experiments have shown that a mixture of amino-acids derived from completely hydrolyzed proteins may be successfully substituted for the proteins themselves, and that the animals fed on such material are maintained in a state of nitrogenous equilibrium, and, indeed, even gain in weight. The same experiments have shown that phosphatides are not essential constituents of food, for they are actually synthesized within the body. Abderhalden maintains that the solution of the problem of obtaining synthetic food is complete, since, although it is not possible to synthesize artificially the complex foodstuffs, yet the synthesis of the fundamental "Bausteine" has been effected. Such a view is of distinct importance to clinical medicine, for it evidently shows that the process of digestion can be carried out entirely outside the animal organism, and that the exhibition of certain fundamental and comparatively simple elements is sufficient to maintain life. The learned professor regards as of the greatest importance the part played by the intestinal wall in the building up of these fundamental elements, and he suggests that the intestinal epithelium is instrumental in effecting the synthesis of the products found in the blood, which are carried to the tissue cells, and there further elaborated. Professor Abderhalden's work in this department of bio-chemistry has become classical in scientific circles. Together with the numerous workers in his laboratory he has covered the greater part of the ground himself, yet one cannot fail to note the fact that he shows a tendency, not uncommon in Germany, to ignore the work of other authorities who have investigated some of the problems which he has tackled. On the whole, however, the book gives an essentially accurate idea of the subject with which it deals.

[3] *Synthese der Zellbausteine in Pflanze und Tiere.* By Professor Dr. Emil Abderhalden. Berlin: Julius Springer. 1912. (Med. 8vo, pp. 138. M. 3.60; geb. M. 4.40.)

HYGIENE OF THE JEWS.

THE hygienic value of Mosaic law has been recognized for centuries and by persons of all creeds. Virchow, indeed, considered Moses the greatest of hygienists. Much interest, therefore, attaches to a volume ably edited by Dr. MAX GRUNWALD,[4] in which the development of the Mosaic hygiene, and the doctrines taught in the Old Testament, in the Talmud, and in the Schulchan Arukh, as well as the modern modifications of old customs, are clearly dealt with by numerous writers. Some of the authors write from the religious point of view; others discuss the sociological importance of the Jewish maxims and practice, while others analyse the precautionary regulations in the light of modern knowledge.

The work is founded partly on the material contained in the Historical Section of the Dresden International Hygiene Exhibition, and has an interesting introduction by Dr. NEUSTÄTTER, the chief organizer of this section. There is a full bibliography, filling some 11 pages—a fact which gives some idea of the attention which has been paid to the various branches of Jewish hygiene. In the successive chapters all these branches are dealt with in considerable detail. The more important headings include personal cleanliness, dietary, method of slaughtering animals, meat inspection, sexual hygiene, prevention of infection, a weekly day of rest, and school hygiene. The object of the descriptions is to lay before the reader the significance of the laws relating to these various branches of hygiene, and the manner in which the details of the laws have been interpreted at different stages of Jewish

[4] *Der Hygiene der Juden.* Edited by Dr. Max Grunwald. Published by the Publishing Department, Historical Section of the International Hygiene Exhibition, Dresden. 1911. 1912. (8vo, pp. 325; with appendices, indices, etc., pp. 64.)

history. At times the writers have allowed their enthusiasm to run away with their pens, and to discuss the habits of the early biblical times, as if the Mosaic laws were in reality based on modern doctrines of health and disease. But, in spite of this, the authors have succeeded in arguing the case for the acceptance of the ancient ideas of hygiene in a capable manner. To the unbiassed critic, for example, the citation of Maimonides as a hygienist of great repute may seem somewhat strained, the more so since practically all his excursions are concerned much more with the religious than the public health point of view. In the same way, though to a less striking extent, the discussions on the actual value of the ritual washing of the hands before meals and other functions may be discounted to some extent. It is quite clear, from the practical point of view, that the mere pouring of water over the hands and the rubbing of them together cannot serve to remove a really dangerous soiling of the skin, and beyond its religious significance, the proceeding is rather an indication of the desire to inculcate cleanliness than a practical means of preventing the chance of polluting food through contact. A highly interesting subject, which receives varied and repeated treatment, is the method of slaughtering. The reason given for the Jewish procedure by cutting the vessels instead of first stunning the animal by the poleaxe or by shooting, is that the muscles are more fully depleted of blood, and therefore less prone to rapid putrefaction. But, as Dr. Kallner points out in a special chapter, this method of killing does not achieve this object. It does not lead to a greater effusion of blood than cutting the throat after the poleaxing of an animal. The difference lies in the reduction of the haemoglobin, and the consequent darkening of the flesh after the latter procedure. These and many other questions are admirably dealt with, and the reader has an opportunity of forming an independent opinion on the data adduced. A large amount of statistical evidence is adduced to show that the mortality among the Jews is lower and longevity greater than among non-Jewish people, but no satisfactory explanation of the differences is given. Dr. F. A. Theilhaber shows with incisive clearness that a race immunity does not exist, and that other suggestions made from time to time are not tenable. He comes to the conclusion that a peculiar disposition of the race, the Jewish environment, and the sociological factors of Jewish life are contributory causes.

The Mosaic law recognizes that there is danger to human life in the ingestion of the flesh of animals whose lungs are affected if the pleurae are involved. There seems to be little doubt that the fact of the infectivity of tuberculosis was recognized by the Patriarch, although not proved for thousands of years. The power of conveying plague to human subjects was in the early days attributed to mice. The book teems with matter of importance and interest, and underlying all these critical surveys is the suggestion that further research into the records would reveal other facts which might be of illuminating value to modern science. Who knows? The aqueduct of Solomon was built with an insight into hydrostatics which would do credit to water engineers of to-day. We have been able to do no more than refer to a few points which may give some idea of the value of this excellent book; it is well worthy of minute study and careful perusal by students of hygiene. Dr. Grunwald and his collaborators are to be congratulated on its production.

MILITARY HYGIENE.

COLONEL MELVILLE'S *Military Hygiene and Sanitation*[5] is an expansion of the lectures which he delivered at the Royal Army Medical College, when professor of military hygiene, to the lieutenants on probation, and to the officers attending the captain's course. In his book he has wisely confined himself to the essentially military problems, and has omitted those questions of hygiene which primarily concern the civilian and are fully dealt with in the ordinary textbooks.

In a short review it is only possible to indicate the general nature of the work and to note a few of its more interesting features. The introductory chapter gives a summary of the special aspects of military hygiene, and should be carefully read by those who are making their first acquaintance with the problems of military hygiene and sanitation. On page 7 Colonel Melville draws attention to the "communal life" of the soldier, and shows how this peculiarity of military life must be borne in mind by all sanitary officers when making any recommendations intended to improve the welfare of the soldier. Marching—a most important subject for every one connected with the army—is scientifically, but practically, discussed and illustrated by examples from past campaigns. The chapters on food and rations are interesting, especially in view of the author's experience on the experimental marches undertaken to determine the necessary field service ration for the soldier.

When dealing with the purification of water in the field, Colonel Melville shows by means of four concise rules that with the power available a high standard of purification together with a rapid output cannot be obtained, and that therefore, notwithstanding any claims made by manufacturers of filtering apparatus, either a lower standard of purification must be accepted or the rate of delivery must be reduced, which means that the thirsty soldier on arrival in camp would have to wait some time in order to obtain pure water.

In the chapters on the removal and disposal of waste matters Colonel Melville insists on the importance of speedy and safe removal of physiological and economic waste matters, and points out that if this condition is fulfilled the actual mode of disposal is of secondary importance. In discussing the danger of spreading disease by the agency of flies, the author lays stress on the value of strong-smelling chemicals in Indian latrines.

A short account of the unhygienic barracks existing in 1857 is given; in these many of the men had less than 250 cub. ft. of space. It is refreshing to turn to the description of the luxurious barracks recently erected at Windsor, and gratifying to learn that the cost of these is less than that of many of the older and less perfect buildings. Some excellent general rules are given for the designing and construction of Indian barracks. One of the very best parts of the book is that on p. 278, on the inspection of barracks. The young medical officer when first appointed to the charge of a unit rarely grasps the importance of his duties, or how to go about them in a systematic manner. This section tells him exactly what to do and how to do it, and the author may confidently expect to earn the gratitude of hundreds of future medical officers.

Some practical advice is given on the subject of clothing, especially in regard to the texture of the material used for underclothing.

The history of enteric and other fevers in India, with a chart showing the admissions and deaths due to this cause, is most instructive. The influence of dust in spreading enteric fever is well illustrated by the account given of the experience of the Quetta garrison.

In our opinion this is quite the best work which has appeared on military hygiene and sanitation. All through the book Colonel Melville gives sound practical advice and is not afraid to state his opinions, which are his own, and are based on many years of practical experience in army sanitary work. We can most strongly recommend this work to all medical officers of the Regular or Territorial Forces, but more especially to those who are commencing a military medical career.

[5] *Military Hygiene and Sanitation.* By Colonel C. H. Melville, M.B.Edin., D.P.H., Royal Army Medical Corps, Professor of Hygiene, Royal Army Medical College. London: Edwin Arnold. 1912. (Demy 8vo, pp. 424; charts 11. 12s. 6d. net.)

WORKMEN'S COMPENSATION.

IT has been stated, and there is no reason to doubt the accuracy of the assertion, that no series of modern Acts of Parliament have been subjected to so much judicial scrutiny as the Workmen's Compensation Acts. Mr. DOUGLAS KNOCKER'S volume, *The Workmen's Compensation Digest*,[6] does not contain a note of every decision; many

[6] *The Workmen's Compensation Digest:* Containing every reported decision of present authority in the House of Lords and the Supreme Court of Judicature in England decided up to May 15th, 1912, and in the Court of Session, Scotland, and the Supreme Court of Judicature in Ireland reported up to May 15th, 1912, under the Workmen's Compensation Acts, 1897, 1900, and 1906. By Douglas Knocker, Esq., of the Middle Temple and South-Eastern Circuit, Barrister-at-Law, M.B.Lond., M.R.C.S.Eng., L.R.C.P.Lond. London: Butterworth and Co. 1912. (Sup. roy. 8vo, pp. 511. 21s. net.)

cases are uncontested, many unreported. It does not even contain every reported case, for the learned author of *Accidents in their Medico-Legal Aspect*, who is responsible for the new compilation, has only selected decisions "of present utility or authority." A digest of this kind will be of the utmost value to the legal practitioner, for it will enable him to ascertain, without any difficulty, the leading decisions on any particular section in the Act of 1906 and the rules and orders appertaining thereto.

The book follows the arrangement of the Act of 1906. The text of the Act is set out, and under every word or phrase that has been the subject of judicial decisions are given all the cases bearing thereon. When, as often happens, a case bears upon more than one phase in the Act, it is given in every place where it is relevant. In many instances the cases grouped under any phase are preceded by short extracts from important judgements, selected as illustrative of the principles applied by the courts in their decisions.

As the medical profession is largely concerned with compensation to workmen, we naturally desire to examine this book from the standpoint of him who has to act as certifying surgeon, medical witness, or medical referee. All the relevant cases appear under the proper heading. For instance, it is pointed out, on the authority of M'Ginn *v.* Udstone Coal Co., Ltd., that the effect of a certificate of a medical referee that a disease is not due to the employment is the same as a similar certificate of a certifying surgeon, and that the effect of the certificate is simply to rebut the presumption given in favour of the workman by Section 8 (2) of the Act, leaving it open to the workman to prove that the disease is in fact due to the employment. In another case (Winters *v.* Addie) the duty of the referee to whom an appeal is brought is made plain. He must certify definitely "yea" or "nay." The responsibility rests with him. The important case of Carolan *v.* Harrington and Sons, Ltd., is also noted. It was there decided that a county court judge has jurisdiction to submit the question as to the cause of death to a medical referee, although the terms of the Act and rules appear to limit the jurisdiction of a referee to cases of injury or disablement. An excellent index completes a work which will be useful to every lawyer and to many members of the medical profession.

NOTES ON BOOKS.

IT was with no little interest that we took up a volume entitled *Microbiology*,[7] and found it to be rather a gem in its way. It is typically transatlantic in the manner in which it sets out to cover the entire field, and it is rare to find a book of such small size with so many independent contributors; no fewer than twenty have been concerned in the production of this work, and, with such a division of labour, the resulting production might have been expected to have been overwhelmingly up to date. Disappointment, however, is in store for those who would consult it on the latest pronouncement; the volume, in fact, is at least a year, if not more, out of date. The subject is undoubtedly too big both for its compass and for its collaborators. The term "microbiology" is now as synonymous with mycology, although it is true protozoa find a place. As might be expected from the academic positions of the contributors, the general chapters on microbiology and on agricultural microbiology are easily the best. The chapters on the infectious diseases of animals and man are distinctly poor and inadequate. On the whole, however, the book is decidedly interesting, and can hardly fail to be of great service to those for whom it is intended.

As a textbook, Professor BUCHANAN'S *Veterinary Bacteriology*[8] is worthy of every commendation. It deals with the subject in a manner which is at once lucid and convincing, and although a very large number of diverse forms have of necessity had to be described and discussed, the information afforded about each is by no means scrappy. In addition to the bacteria, the yeasts, moulds, and protozoa pathogenic for the domesticated animals also meet with a fair share of treatment. The book is concerned chiefly with the morphology and cultural characters of these organisms and with their pathogenic properties, and it does not enter into any very detailed discussion of technique. In this respect, as in several others, the author gives evidence of profitable teaching experience. Most of the information is thoroughly up to date and reliable, and the only serious fault that can be found with the book is a certain ultra-American looseness of style which leads to not a few solecisms.

PARTLY, no doubt, as a natural reaction after the great boom of a year ago, partly also as a consequence of the recent uncongenial summer, interest in our little enemy, the house-fly, has declined to a very appreciable extent. The public memory is short, and it is easily occupied by fresh novelties; but it would be a pity that attention should be wholly withdrawn from an object which is of undoubted hygienic importance. Dr. L. O. HOWARD'S book on *The House Fly—Disease Carrier*,[9] will serve a very useful purpose in reviving interest in the matter both scientifically and popularly. It is a particularly good book of its class, attempting as it does to give a general summary of all the facts known in regard to the house-fly in a manner which is easily comprehensible to those without special knowledge. It certainly reviews the subject very thoroughly, and the various sections are surprisingly full. There is an excellent account of the life-history and habits of the fly. Its diagnostic features are summed up briefly and concisely, and a short account is given of about a dozen other flies which occasionally inhabit houses. The natural enemies of the fly provide an interesting chapter, and Dr. Howard's lapse in almost omitting to mention spiders in this category will amuse the reader. As might be expected from the title, the carriage of disease by flies is given a prominent place, and although Dr. Howard may not be qualified to deal with this as an expert authority, his review is quite a satisfactory piece of work. The most interesting section of the volume from a practical point of view is that on "Remedies and Preventive Measures." The author is an optimist, and never ceases to stimulate the hope that we shall eventually be able to deal effectively with the fly problem. The majority of remedial measures emanate from America, where the fly nuisance is greater than it is even in this country, and where the authorities have been particularly active in endeavouring to combat it.

It seems unnecessary to further appraise the value of MITCHELL BRUCE'S *Materia Medica and Therapeutics*.[10] which has now reached a ninth edition. In preparing the new and revised edition Dr. Bruce has had the assistance of Mr. W. J. Dilling, Lecturer in Pharmacology at Aberdeen University. It is five years since the last edition appeared, and in the interval not a few alterations of considerable importance have been necessitated. These have affected more particularly the section on general therapeutics, which has been influenced by recent physiological researches, especially in connexion with the digestive and circulatory systems. In the appendix notice is taken of a number of non-official remedies, including ionic medication, radium, organo-therapeutic substances, and vaccines. It is still somewhat of a novelty to find vaccines incorporated in a textbook of materia medica, although their therapeutic value is almost universally recognized both theoretically and practically. Naturally the treatment of the subject is very brief, but so far as it goes is quite accurate. Exception might be taken to the perhaps somewhat undue stress laid on the danger of the "negative phase," although it is quite in accord with modern teaching. The value, too, of Haffkine's plague vaccine is somewhat underrated by the statement that immunity "lasts for a few weeks only." The inclusion of Doyen's neoformans vaccine seems rather useless when it is stated that it is "practically valueless," and in view of the fact that the space occupied by it might have been devoted to some other vaccine of more promising worth. On the whole, however, the facts with regard to vaccine therapy have been carefully chosen and efficiently presented.

[7] *Microbiology for Agricultural and Domestic Service Students.* Edited by Charles E. Marshall. London: J. and A. Churchill. 1912. (Demy 8vo, pp. 745; 128 illus. 10s. 6d.)

[8] *Veterinary Bacteriology.* By R. E. Buchanan, Ph.D. Philadelphia: W. B. Saunders Company. 1911. (Med. 8vo, pp. 516; figures 214. 13s. net.)

[9] *The House Fly—Disease Carrier.* By L. O. Howard, Ph.D. London: John Murray, 1912. (Demy 8vo, pp. 332; figs. 40. 6s. net.)

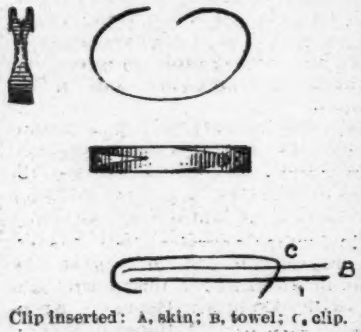
[10] *Materia Medica and Therapeutics.* By J. Mitchell Bruce, M.A., LL.D., M.D., F.R.C.P., and Walter J. Dilling, M.B. Ninth Edition. London: Cassell and Co., Limited. 1912. (Cr. 8vo, pp. 956. 6s. 6d. net.)

MESSRS. W. R. GROSSMITH, 110, Strand, have recently brought out a new catalogue containing a multiplicity of illustrations of the artificial limbs made by them; copies can be obtained on application.

MEDICAL AND SURGICAL APPLIANCES.

A Satisfactory Towel Clip.

MR. G. S. THOMPSON, F.R.C.S.Eng. (Kimberley) writes: At my suggestion the clip illustrated was made for me by Messrs. Mayer, Meltzer, and Co., of Capetown. The defects of most, if not all, towel clips or forceps are: (1) Undue and obstructive bulkiness, rendering them unsuitable for certain situations, or liable to get in the way or fall in an annoying manner into the wound during manipulations—as, for instance, in the abdomen. (2) Failure to retain the towel tucked round and under the skin margin, thereby allowing the latter to present during the progress of the operation, and not effecting the desideratum of a skin-free exposure. This clip overcomes all these disadvantages. It consists of a strong, curved piece of flattened steel spring. At one end it is prolonged into two sharp teeth, these being united below so as to retain the border of the towel under the skin edge and prevent it slipping round to the upper surface; at the other end into one tooth, which serves to fix the clip in position by penetrating the towel and skin to one side of the wound. These clips are made in three sizes, 1, 2, and 3 in. in length. After fixture they are quite out of the way, lying flat upon the surface. They are also quite cheap. The advantages claimed are: (1) Self-retaining action owing to curved spring shape; and however much the skin be pulled to one side the clips retain their hold unless deliberately released by the operator. (2) Smallness of size and therefore unobtrusiveness, leaving an unobstructed field. (3) Impossibility of towel being worked round skin margin to upper surface. (4) Adaptability to any part, not only flat but curved surfaces, as the limbs and scalp and even the fingers. (5) Extreme simplicity of design. Three or four of these clips on either side of the wound are usually sufficient. There is only one towel clip with which I am acquainted that will remain where placed, owing to the presence of two additional teeth on the shanks near the handles; but its bulkiness and inability to retain the towel under the skin are its defects, although this forceps is an improvement on most, if not all, of the others. So far as the latter point is concerned, I think it is very desirable in all or nearly all operations that the skin, which is likely to be, or which might be, touched during the operation, should be completely hidden from view, so as to obviate one possible, and very probably a chief, cause of wound infection, no matter how carefully the subject's skin has been prepared. Of course it is assumed that gloves are worn by all to obviate hand infection. Both these possibilities or probabilities can or ought to be prevented. We can boil coverings and gloves and be certain of sterilization, but we cannot boil our hands and skin, heat being the only certain and desirable method of sterilization. Now, although the use of gloves is usually observed, it is quite common, if not the usual fault, to see the patient's skin presenting to view in the region of the wound. This, I hold, is bad technique. The clips described, amongst other things, do away with this cardinal defect. In this connexion also I would like to suggest a modification by way of improvement in Jordan Lloyd's very useful hook retractor. The hook end of this instrument, being round, will not readily penetrate the skin, its disadvantage being that it slips, failing to retain a hold. This can be overcome by converting this hook into a blade flattened sideways, like that on a Hagedorn needle. This I have had done, and find the change most useful, penetration of the skin being now quite easy, instead of with difficulty or not at all as in the usual pattern.



Clip inserted: A, skin; B, towel; C, clip.

THE fourth annual report of the National Food Reform Association, in addition to giving an account of its proceedings during the past year, including the Guildhall conference and the publication of *Our Children's Health at Home and at School*, contains a good many expressions of opinion from medical men and others as to the need of a wiser choice of food materials and of more skill in their preparation for the table. Copies, price 3d., with a list of publications, including books of recipes, may be obtained from the office of the association, 178, St. Stephen's House, Victoria Embankment.

RECENT NEUROLOGICAL INVESTIGATIONS IN SPAIN.

IN the histological laboratory of the Madrid University, of which Ramón y Cajal is the Director, a little band of workers carry out important researches. Some of their results were published in the transactions of the laboratory (1910–11).[1]

Ramón y Cajal[2] criticizes the statements of Abundo and Dustin that the sensory portion of the posterior bundle has the power of re-establishing itself after separation of the posterior roots, and relates a series of experiments which lead him to the conclusion that the intramedullary portion of the posterior roots has very little power of regeneration, owing to the absence of neurotrophic materials within the spinal cord and the presence of mechanical hindrances. In very young animals, however, and notably in the newborn, under exceptionally favourable circumstances, if the neurilemma has not been destroyed, or if a portion of the root has escaped section and has been merely inflamed, some regenerating fibres may be seen penetrating the cord and proceeding to the posterior bundle in an ascending or descending direction. He is uncertain whether these efforts at regeneration are permanent or transitory.

Some further experiments[3] were made to examine the persistence of life in the sensory nerve cells of the central nervous system after they have been separated from their trophic centres, and also to test the resistance of nerve fibres to autolysis. Small pieces of the cords of young animals were placed in various nutritive fluids (blood serum, cerebro-spinal fluid, etc.) at a temperature of 38° to 39° C., and examined after periods varying from eight to forty-eight hours. The histological examination showed signs of active growth proceeding from the ganglion cells. It was also observed that non-medullated axons had great powers of resistance, while the medullated degenerated very quickly. The neurofibrils of the muscles preserved their power of taking the silver stain up to fifty or fifty-four hours after being cut off.

Ramón y Cajal records also another series of experiments[4] made on young animals to examine certain regenerative processes in the central nervous system in order to ascertain whether they were permanent. Lesions were made in the brain and spinal cord, and after one to twenty days the animals were killed and the areas in question cut out and treated by the silver nitrate method. An interesting difference was observed in the behaviour of the white and grey substance. In the early days, after the lesion, the nerve fibres of the white substance showed definite signs of sprouting. These signs of regeneration, however, disappeared progressively in the second, third, and fourth weeks. In the grey substance the conditions were reversed. During the first two weeks after the lesion very few regenerative signs were noticed, but at a period of twenty days the number of newly formed fibres had markedly increased. The observations led him to the conclusion that, excepting the regenerative signs in the grey substance, all other sprouting phenomena of the axons of the nerve tracts represent temporary reactions, which are destined to disappear.

In two other articles[5] he gives the results of a study of the very early stages of degeneration in the cerebellum and cerebrum not previously described. The changes were already well marked twelve hours after the lesion. They concern the axons of the cells interrupted by the lesion, as well as many which had not been mutilated, but had apparently only been stimulated by the exudations and other inflammatory processes. They consisted in general hypertrophy of many of the fibres, varicosities in the axons, and terminal balls, from which fibrils were sprouting. These new formations were mostly in the medullated axons. They continued for five or six days, and then gradually disappeared. In the specimens examined after ten days from the time of the lesion, they had lessened considerably in number, having apparently been reabsorbed. The conclusion drawn coincides with that of Rossi and Marinesco and Minea that no true regeneration takes place in the cerebrum or cerebellum, that the new

[1] T. VIII, 1910.
[2] *Trabajos del laboratorio de investigaciónes biolog. de la Universidad de Madrid.*
[3] T. VIII, 1910.
[4] T. VIII, 1910.
[5] T. X, 1911.

formations are purely intraprotoplasmic or neurobional, and that they are unable to traverse the pre-established limits of the axon and its branches, or form new appendices.

Lafora[6] describes some cases in which he examined the cerebral cortex for karyorrhexis, that is, those cell changes which involve the extrusion of the chromatin of the nucleus. The chromatin shows itself in the form of round or oval bodies, which mostly remain connected with the nucleus by means of very fine threads. These changes were found in syphilitic gumma, dementia senilis, and in a case of experimental haemorrhage in the cortex cerebri of an ape. They were most abundant in the cornu ammonis. He believes that they are the beginning of cell disintegration, perhaps caused by loss of power in the cell to imbibe sufficient nourishment. Illustrations of cells stained with toluidin blue and by Heidenhain's method show this form of degeneration very well.

Achúcarro[7] examined histologically a case of progressive general paralysis in order to study the nature of the so-called "Stäbchen" cells. He found these cells in numbers in the cortex cerebri, but most abundantly in the cornu ammonis. They were mostly attached to the pyramidal cells or their processes, and were sometimes in the forks of the processes. Treated by Herxheimer's method they showed inclusions which took a deep red stain (Scharlachrot), and by Cajal's method deep black granules in the centre. These are probably products of disintegration. He thinks that these "Stäbchen" cells are probably a special form of phagocyte for the products of disintegration, and that they shape themselves according to the particular cell in process of degeneration—in this case the protoplasmic prolongations of the pyramidal cells of the cortex. Another article[8] by the same writer shows the changes found in the cerebral pyramidal cells of rabbits inoculated with the virus of rabies and *Sporotrichon beurmanni*.

In the report of a case of this disease by Ritchie and Walker,[9] changes in the brain cells were not mentioned, as granulomata were not present in the brain. Achúcarro's prefatory remarks allude to the methods of Nissl, Bielschowsky, and Cajal for staining nerve tissues, and to Cajal's researches on the structure of the nuclei of pyramidal cells, as forming a basis by means of which new elements in pathological cases may be detected. In the cerebral pyramidal cells the nucleus has a somewhat complex structure. It has a fundamental substance in which argentophile granules are embedded, observed distinctly for the first time by Simarro adjacent to the nucleolus; there are also the granules of Levi, and the corpus accessorium of Cajal, which is situated somewhat apart from the nucleolus. Further, there are the neutrophile and hyaline granules of the karyoplasma and the reticulum revealed by silver nitrate, resembling Holmgren's protoplasm reticulum. Achúcarro mentions only the changes noticed in the argentophile granules, the granules of Levi, and in the karyoplasma in general, more especially in the cornu ammonis. Siciliano was the first to call attention to a special nuclear lesion in the cells of the cornu ammonis of rabbits affected by rabies, but did not give a detailed description of the complex process of degeneration fully entered into by Achúcarro in 1908 in an article on the formation of "Stäbchen" cells. In the present cases the nuclear changes were characterized in the beginning by an increase of the basophile and acidophile substances, accompanied by the disapperance of the reticulum. The more advanced stages showed conglomerates of basophile and acidophile substances. Finally, destruction of the membrane and changes in the body of the cell made it impossible to differentiate the nucleus and protoplasm. The nuclear changes in the cortex cerebri of rabbits affected by rabies and sporotrichosis showed some resemblance as to the form they took, but in essence were distinct. In rabies the degeneration is apparently primary, whereas in sporotrichosis it follows the lesion of the nerve protoplasm. In rabies it begins by a proliferative stage of progressive character affecting the argentophile granules, whereas in sporotrichosis the initial stage consists in the separation of the membrane and the retraction of the karyoplasma. In both cases the nuclear changes have a common localization in the cornu ammonis.

Tello[10] discusses the causes of regeneration in the nervous system, and describes a series of experiments undertaken by him analogous to those of Lugaro, who grafted nerve tissue into the cerebral cortex of dogs three months old; examining the affected parts after varying periods. Tello repeated these experiments in adult rabbits, modifying somewhat the conditions. The piece of nerve tissue chosen was from the sciatic nerve, and the situation of the graft was in the cerebrum, cerebellum, and optic nerve respectively. Histological examination showed a surprising difference in the regenerative capacity produced by the stimulus of a foreign tissue as compared with the ordinary regenerative capacity existing in the nervous centres. The cortex of the cerebrum, cerebellum, and optic nerve showed definite signs of newly formed fibres in the axons separated by the lesion. The fibres had unquestionably crossed the border, entered the connective tissue, and penetrated the grafted nerve, in which they appeared to be growing rapidly. These signs were more vigorous in the optic nerve and cerebrum than in the cerebellum. Tello is convinced that new fibres are formed under the described conditions which traverse large areas in the interior of foreign tissues. He thinks that the action is a chemical one, exciting the regenerative capacity of the axons.

[6] T. VIII, 1910.
[7] T. VIII, 1910.
[8] T. IX, 1911
[9] British Medical Journal, July, 1911.

[10] *Trabajos*. T. IX, 1911

THE INTERNATIONAL MEDICAL CONGRESS, LONDON, 1913.

Since the programme of the seventeenth International Congress of Medicine to be held in London from August 6th to 12th, 1913, was published in the Supplement to the Journal of March 9th, considerable progress has been made in the general arrangements and in the organization of the Sections.

The congress will be opened by H.R.H. Prince Arthur of Connaught at the Albert Hall, at 11 a.m. on Wednesday, August 6th, and on the afternoon of the same day the first of the general addresses will be given by Professor Chauffard (Paris) in medicine; the address in pathology will be given by Geheimrat Professor Paul Ehrlich (Frankfort) on Friday, August 8th, and on August 12th the President of the Local Government Board will give the address on public health; Professor Harvey Cushing (Harvard) that on surgery; and Mr. W. Bateson that on heredity. The general secretary of the congress is Dr. W. P. Herringham, and from him at the office of the congress, 13, Hinde Street, London, W., the full programme can, we believe, be obtained.

We may, however, indicate some of the chief discussions which have been arranged. The Section of Anatomy and Embryology (President, Professor Arthur Thomson) will hold a joint discussion with the Section of General Pathology and Pathological Anatomy (President, Mr. S. G. Shattock) on the excitatory and connecting muscular system of the heart, to be introduced by Professor Dr. Wilhelm His (Berlin). The Section of Bacteriology and Immunity (President, Professor G. Sims Woodhead) will hold a joint discussion on cancer with the Subsection of Chemical Pathology (President, Dr. F. Gowland Hopkins). In the Section of Therapeutics, over which Sir Lauder Brunton will preside, Professor Dr. R. Gottlieb (Heidelberg) and Professor T. C. Janeway (New York) will open a discussion on the comparative value of cardiac remedies. In the Section of Medicine, under the presidency of Sir William Osler, the first subject for discussion will be the pathology of heart failure. It will be introduced by Professors H. Vaquez (Paris) and v. Wenckebach (Strassburg). On the following day the section will hold a joint discussion with the Section of Physiology (President, Professor E. Schäfer) on the correlation of organs of internal secretions and their disturbances. The Section of Physiology will also hold a joint discussion an endogenous metabolism of proteins with the Subsection of Chemical Pathology, to be introduced by Professor Abderhalden (Halle).

The Section of Surgery (President, Sir W. Watson Cheyne) will hold two joint discussions, the one on the

diagnosis and treatment of early renal and vesical tuberculosis with the Section of Urology (President, Mr. Hurry Fenwick), and the other on the treatment of tumours of the brain and the indications for operation with the Section of Neuro-Pathology (President, Sir David Ferrier). The last-named discussion will be opened by Professors Bruns (Hanover), Harvey Cushing (Havard), v. Eiselsberg (Vienna), and Dr. H. H. Tooth (London). The Section of Surgery will also have a discussion on the surgery of the arterial system, introduced by Professors Rudolph Matas (New Orleans) and V. A. Oppel (St. Petersburg). The Subsection of Orthopaedics (Mr. Robert Jones of Liverpool, President) will discuss jointly with the Section of Radiology (President, Sir James Mackenzie Davidson) the value of radiographs of bones and joints in orthopaedic surgery. In the Subsection of Anaesthesia, which will meet under the presidency of Dr. Dudley W. Buxton, the subjects for discussion include recent methods of producing analgesia and general anaesthesia.

The Section of Obstetrics and Gynaecology (President, Sir F. H. Champneys) will hold two joint discussions, the one with the Sections of Diseases of Children and of Hygiene and Preventive Medicine on infant mortality in the first four weeks of life, and the other with the Section of Radiology on Roentgen and radium therapy in gynaecology.

Among the subjects for discussion in the Section of Ophthalmology (President, Sir Henry Swanzy) will be operations for glaucoma and affections of the eye produced by undue exposure to light.

The effects of the ductless glands on development, the treatment of tuberculosis in childhood from the surgical point of view, and the nature and pathology of polioencephalitis and poliomyelitis, will be subjects discussed in the Section of Diseases of Children, which meets under the presidency of Dr. Eustace Smith.

In addition to the joint discussion with the Section of Surgery, the Section of Neuro-Pathology will have debates on cerebellar disease, introduced by Dr. Babinski of Paris; on motor aphasia, anarthria, and apraxia, introduced by Professor Dejérine of Paris; on the relation of the myopathies, introduced by Professor Oppenheim of Berlin; and on the nature of the condition called parasyphilis, introduced by Dr. F. W. Mott. The President of the Section of Psychiatry is Sir James Crichton-Browne, and the first subject put down for discussion is the aims—educational and therapeutic—of the psychiatric clinic; another subject is psycho-analysis, and the Section will hold a joint meeting with the Section of Forensic Medicine for the discussion of the psychology of crime.

The Section of Dermatology and Syphilography (President, Sir Malcolm Morris) will have two discussions on syphilis—one on its dangers to the community, jointly with the Section of Forensic Medicine, and the other, jointly with the Section of Naval and Military Medicine, on its treatment by salvarsan and allied substances, introduced by Professor Ehrlich. In addition to the joint discussions already mentioned, the Section of Urology will hold discussions on the treatment of early malignant disease of the prostate, and on haemic infections of the urinary tract.

The Section of Rhinology and Laryngology (President, Sir StClair Thomson) will hold two joint meetings with the Section of Otology—the one on the treatment of diseases of the throat, nose, and ear by salvarsan and other arsenical compounds, and the other on the treatment of diseases of those regions during the active stages of infectious fevers. Among the subjects to be discussed by the Section of Otology meeting alone, under the presidency of Mr. Arthur Cheatle, will be the pathology of deaf-mutism, and climatic and occupational influences in diseases of the ear. The President of the Section of Stomatology will be Mr. Morton A. Smale, and among the subjects for discussion are the relation of nasal obstruction to dental disease; at a joint meeting with the Section of Hygiene the subject for debate will be the supervision of the health of children between infancy and school age.

Dr. Arthur Newsholme will preside over the Section of Hygiene and Preventive Medicine, and among the subjects for discussion not already mentioned will be the effects of dust in producing diseases of the lungs and visual defects in school children. The Section of Forensic Medicine, over which Professor Harvey Littlejohn (Edinburgh) will preside, will hold discussions on the cause and prevention of suicide, and on the teaching of forensic medicine, including the construction and equipment of a medico-legal institute.

The Section of Naval and Military Medicine will have as President Sir James Porter, K.C.B., Director-General, R.N., and among the subjects for discussion will be hospital ships, antityphoid inoculation, and the physiology of physical training and marching. This section will have a discussion jointly with that of Tropical Medicine, over which Colonel Sir David Bruce will preside, on sanitary organization in the tropics. Plague, beri-beri, Leishmaniasis and relapsing fevers are the other subjects put down for discussion by the Section of Tropical Medicine.

The subjects selected for discussion in the Section of Radiology, under the Presidency of Sir James Mackenzie Davidson, are the radiotherapy of malignant disease and the radiography of the stomach and intestines and of the chest.

The XXIII Section, that of the History of Medicine, is newly formed, and will meet under the presidency of Dr. Norman Moore, who will give an address on the history of medicine in England. A large number of independent papers will be read in this section.

The general rule will be that in each section the morning session will be reserved for the discussions, the independent papers will be taken in the afternoons. The council of each section will arrange the order in which the selected papers shall be read, and any paper offered after April 30th, 1913, will be placed upon the agenda after the discussion of those announced before that date. All documents must be typewritten; the official languages are English, French, German, and Italian.

SCIENCE NOTES.

DURING the last ten years highly artistic and accurate paintings and drawings (chiefly of animals) have been discovered on the walls of the ancient caves which abound in the North of Spain and in the neighbouring parts of France. When first brought to the notice of archaeologists, the cave pictures, owing to their merits as works of art, were regarded with suspicion, but evidence was soon forthcoming to show that they were genuinely ancient and belonged to the later paleolithic periods of man's evolution—the Aurignacian, Solutréan, and Magdelenian—the three ages which, it is believed, followed immediately the last of the glacial cycles. No one has taken a more active part in exploring these cave pictures than the well-known French archaeologist, Abbé Breuil. While in England lately, investigating the authenticity of certain collections of eoliths—as to whether or not they were of human workmanship—he accompanied Professor Sollas, of Oxford, on an excursion to the caves along the coast of the Gower peninsula, west of Swansea. At Bacon's Hole, a few miles from the Mumbles, one of the caves which has already yielded the handiwork of paleolithic man, they found, not pictures, but coloured bands, coated by stalagmite—the first sign, so far, discovered in England of cave decoration. Abbé Breuil, from the type of art thus discovered at Bacon's Hole, had no difficulty in recognizing it as belonging to the same species of work as is found in the ancient caves in the South of France. It is improbable that the cave painting of Bacon's Hole is an isolated example. We may hope to hear of further discoveries soon, but it seems improbable that so fine examples as those found in the Santander caves of Spain could have escaped the sharp eyes of our cave hunters.

The October number of *Bedrock* contains an important paper by Professor Arthur Keith on recent discoveries of ancient man. He sums up with the statement that recent discoveries in the Dordogne have shown that Neanderthal man is confined to a restricted and comparatively late date of the Pleistocene epoch.

He appears for a period, and is then replaced by modern man. His transformation into modern man is refuted by both anatomical and archaeological evidence. We have, therefore, still to seek for the primitive and ancestral forms of modern man. The discoveries in England show that we must go a long way further back in the geological record than is usually believed to find our ancestral form. At least, in the middle of the Pleistocene period, long before the period of Neanderthal

man of the Mousterian age in France, modern man had appeared in England. It is therefore in the Pliocene formations we are most likely to meet with the early forms of modern man. There are no deposits in Europe so likely to give us a clue to the ancestral forms of modern man and the date of his evolution as the Pliocene and Pleistocene strata of East Anglia.

Professor Keith adds that progress can never be made until geologists and anthropologists realize that human remains must not be rejected purely on the ground that they are similar to those of modern man. Above all, he urges that we must educate the workmen and managers engaged in every work which necessitates the exploration or disturbance of recent geological deposits. Mr. Hugh S. Elliott writes on modern vitalism, and Dr. A. M. Gossage on human evidence of evolution, whose controversial methods are criticized by Dr. Archdall Reid. Two articles deal with psychical research.

The research which Dr. Myer Coplans has been conducting in the Atlantic covered, we are informed, a wider field than that of iceberg detection; the work done during his recent voyage by the R.M.S. *Edward* to Quebec and back related mainly to a determination of the salinity of the Atlantic. The general objects of the investigation are to work out the course of ocean currents and the influence of estuarial waters and coast lands on sea salinity generally, and more particularly to determine the salinity of the currents around Newfoundland and the course pursued by large floes of ice in those waters and the differences which their presence creates before they can be detected by sight. A complete record of the ocean from Avonmouth to Rimouski in the St. Lawrence river, and from thence up past Montreal as far as Niagara, was obtained during both the outward and homeward journeys. It is considered that the results when published in detail will throw considerable light on the behaviour of bergs and the course of their drift around Newfoundland, which was practically encircled during the investigations. A further result may be a revision of present views as to the course of estuarial waters in the Bristol Channel and in the Gulf of St. Lawrence. The research was conducted by means of an apparatus devised by Dr. Myer Coplans as the outcome of work commenced by him in the pathological laboratory of the University of Leeds early last year. This showed that the electrical conductivity of water is affected by two factors—its salinity and its temperature. The greater the salinity the higher the conductivity, and the lower the temperature, at all events in respect of figures under 20° C., the greater the fall in capacity for electrical conduction. Sea-water, therefore, when diluted by streams of inland water, and especially by highly pure water, such as that derived from glacier ice, must exhibit lessened conductivity; the lowered temperature resulting from the presence of floating bergs will operate in the same direction. It was on these general data that the appliance used during the recent investigation was devised. It cut out automatically all variations due to temperature, presumably because the primary object of the research related to the course of currents due to the inflowing of estuarial streams of water. In an appliance specially intended to assist in the detection of icebergs, both factors would no doubt be taken into consideration, temperature variations and salinity variations being recorded side by side, each record being used as a check upon the other. The results obtained during the recent investigations are being reduced to cartographical form by Mr. C. de V. le Sueur, Lieutenant R.N.R., second officer of the ship in which the investigation was pursued.

LITERARY NOTES.

Among the contents of the second number of the *Edinburgh Review*, issued under the editorship of Mr. Harold Cox, published on October 17th, is a paper on Secret Remedies, by Mr. Hugh Elliot.

The *Journal of the Royal Sanitary Institute* has issued this month a special supplement wholly devoted to matters of colonial interest. It is now thirteen years since colonial centres for the examinations of the Institute were first established. Following on this courses of lectures and training were arranged; meetings were held for reading and discussing papers; and in Hobart a conference for the instruction of local sanitary inspectors, and a school of instruction for dairymen in sanitary matters, were attended by inspectors and dairymen from all parts of the State. In Western Australia and South Africa the members have been formed into definite branches of the Institute for the holding of meetings and for engaging in other efforts for the general advancement of sanitary knowledge. South Africa, the largest branch, numbering over one hundred members, has been the first to organize a general congress on the lines of the meetings annually held by the Institute in Great Britain and Ireland. All these efforts were initiated and organized by the members of the Institute in the several centres, and they were actively supported by the public health authorities. The Colonial Supplement contains the address delivered by Sir Frederic de Waal, the Administrator of the Province of the Cape of Good Hope, and a report of the proceedings of the congress. There are also papers referring to sanitary questions in British Guiana, Western Australia, and Canada.

It was stated in the British Medical Journal, on the authority of Dr. Nevins Hyde, that the first authentic description of pellagra was by a Spanish physician, Gaspar Casal, who under the name of *Mal de la Rosa* gave an account of it as observed by himself among the peasants of the Asturias in 1735. His work, which was written in Latin, was published after his death by Joseph Garcia in 1762. We are indebted to Dr. Aurelio Perez Ortiz, of Torrelavega, Santander, for an earlier account taken from a Spanish work by Pedro Casal, which was published in 1707. The following is a translation of the Spanish text:

This is a disease the most horrible that can be conceived, and it presents before all a symptom which consists in a certain crust, which although at first red soon degenerates into a dry blackish crust split by cracks reaching down to the flesh which cause great pain. It must be noted that for this affection to have the name of pellagra and rose disease, there must be adherent crusts to the metacarpus and metatarsus since, although they appear on other parts of the body, they do not receive this name. These crusts disappear in the summer on account of the sweat, and in the place which they occupied there remain certain red surfaces like scars of burns. From the reddish colour of the scar is derived the name rosa which is given them here. Every year at the approach of spring the crusts come out anew, and in those in whom the disease is not so developed there appear other smaller crusts. There is another situation where this disease shows itself, and that is at the lower part of the neck over the point of junction of the clavicles with the sternum. I have asked some of the persons afflicted with this disease to see if one could discover something about the etiology, and here is what they have told me. In August last I saw a man who made the following statement: That he was accustomed to see himself attacked; that he had some appetite, but when he ate he fell into a state of lethargy. In the month of March he remained in a state of stupor. He felt a great fatigue in all his limbs, and particularly in his legs. In walking his head was affected and he fell down, but he never lost consciousness. He was always languid; his feet were cold, his mouth dry, and his tongue foul. His wife suffered in the same way, and said that she could not bear the heat of the sun or fire, and that she never felt cold. Some days before the spring there appeared some very large crusts on the metacarpus and metatarsus, which in the spring fell off, leaving a scar. Other patients said that vesicles came out in their mouths, that their legs were limp, but that when they began to walk they got stronger. All the skin of the hands was covered with a black crust; wherefore the "disease of the rose" was in reality black. We may sum up the symptoms as follows: First, nodding of the head. Secondly, vesicles in the mouth. Thirdly, great fatigue. Fourthly, crusts on the hands and feet, and those which appear on the neck in the manner of a collar. Fifthly, the burning heat which they feel in bed. Sixthly, the want of resistance to heat and cold. And, finally, a tendency to weeping to appear without manifest cause. Many of the cases end in suicide. Their food is maize, milk, chestnuts, herbs, and nuts, and the patients have obtained great relief when their food has been replaced by other substances of a more sustaining kind.

We do not know whether Pedro was another Christian name of Gaspar Casal or whether there is some confusion of personality. But the work is the same, as may be seen on comparing the Latin text of the description of the pellagrous skin with the Spanish quoted above:

Degenerat tandem in crustam siccissimam, scabrosam, nigricantem, profundis, saepissime intercissam fissuris, etc.

British Medical Journal.

SATURDAY, OCTOBER 19TH, 1912.

TUBERCULOSIS AND THE TEACHING HOSPITALS.

Before the Government scheme for national insurance was promulgated in the Insurance Bill, before the appointment of the Astor Committee, and before the issue of the circular of the Local Government Board to county councils on the organization of the treatment of tuberculosis occurring not only among the insured but throughout the whole population, the practical value of the tuberculosis dispensary had been widely recognized, and such institutions had sprung up in many large towns. As a rule they had no organic relation with other institutions in the same town, and in a weighty letter addressed to the *Times* last August Sir William Osler, writing from his experience in America, insisted emphatically on the need for concerted action. Appearing as it did during the first weeks of the holiday season, the importance of his letter, both from the medical and from the lay points of view, may have been overlooked, and it therefore seems well to call renewed attention to one of the points he then made.

After mentioning certain other advantages of linking the general hospitals with the tuberculosis scheme —the proposal he was then advocating—he said that for the sake of the public he would be sorry to see the members of the staffs of general hospitals deprived of the opportunity of seeing so important a disease as tuberculosis. The public loss he had in mind was no doubt in a large measure the defect which might thus arise in the completeness of medical education, for he went on to instance the Henry Phipps Tuberculosis Institute at Baltimore, which through its connexion with the Johns Hopkins Hospital "now forms an important part of a great medical school through which every student as a matter of routine passes as a clinical clerk. If for no other purpose than this, every general hospital with a medical school should have its tuberculosis department." Attention to this point seems to be a natural corollary to the policy of the Association in insisting that the domiciliary treatment of tuberculosis should be retained in the hands of general practitioners. Tuberculosis of the lungs is, as a rule, excluded from the wards of teaching hospitals, and during the course of instruction in out-patient departments there has been too little opportunity of spending much time in studying the indications of the early forms of the disease. With the withdrawal of tuberculosis patients from ordinary hospitals this tendency must increase, and it might easily come about that the average student of medicine would become qualified with only a very scanty experience of pronounced consumption, and with hardly any acquaintance with its earliest indications. The very opposite is the result which should be sought, for it will become more and more important that all future practitioners should acquire a good knowledge of the incipient forms of tuberculosis, and of the various methods by which they may be diagnosed.

The organization proposed by Sir William Osler involves a full supply of trained medical officers, and he points the way to the provision of such a supply by advocating a system whereby a tuberculosis dispensary shall be linked up with each large hospital having a medical school. Not only should there be the dispensary or out-patient department devoted exclusively to tuberculous cases, but there must be a sufficient number of beds allotted for the proper treatment and study of such cases in different stages of illness or convalescence. Just as there are in most large hospitals some special wards for the study and treatment of syphilis, so ought facilities to be afforded for tuberculosis in all its forms.

That such a scheme with suitable modifications is by no means Utopian, but has been in actual use for many years, may be gathered from the reports which have been published annually by the authorities of the Johns Hopkins Hospital at Baltimore. It is probably not generally known that the initial steps toward the establishment of dispensaries for the early diagnosis of consumption were taken by Sir William Osler himself in the year 1898. He foresaw the advantages that must accrue from such a system, and started a fund for the purpose and a society to bring willing workers together. His efforts were backed up by lady members of the profession in Baltimore, who undertook the visitation of the patients in their own homes after the presence of disease in them had been discovered at the dispensary. With each succeeding year the work increased, and new buildings with laboratories were provided by the generosity of Mr. Phipps. The association with the hospital kept up the supply of physicians, who undertook the work of daily attendance at the dispensary for diagnosis and prescription of appropriate treatment for each case, and the visiting nurses at short intervals reported on the progress of their respective patients. From the last report, dealing with the work during 1911, it appears that the home visiting had become so extended that it called for the services of a staff of municipal nurses, all of whom have had special training. But the number of cases to be dealt with daily by the physicians would appear also to have become quite unwieldy, surpassing the powers of the medical school to supply sufficient honorary officers, and the necessity for well-paid appointments is hinted at. A further difficulty is likewise felt in obtaining sufficient in-patient accommodation for patients under special treatment by tuberculin or otherwise.

The lessons to be learnt from these valuable reports point unmistakably to the need for linking a tuberculosis dispensary with each large school hospital, and the provision of an adequate number of beds in the hospital for the study and treatment of tubercle in its earliest manifestations. The addition of special wards to our existing hospitals, most of them already hampered by accumulating debt, can hardly be expected, but the affiliation of the chest hospitals for teaching purposes with the existing medical schools is not by any means impossible. The cases seen and diagnosed at the dispensaries attached to the general hospitals could then be followed up in the wards of the chest hospitals, and by such means every student would have the opportunity of seeing the disease in all its stages.

Medical men throughout the world are agreed as to the means by which consumption should be attacked, but concerted action is required if the victory is to be won. It is for the medical schools to train the rank and file of the antituberculosis army.

PREHISTORIC CRANIO-CEREBRAL SURGERY.

IN 1868 M. Prunières, while exploring a barrow in France belonging to the Neolithic period (2000-3000 B.C.), discovered a human skull showing a large opening which apparently had been deliberately and successfully made during the life of the individual. At the time when this first evidence of prehistoric trepanning came to light European surgeons regarded the operation as highly dangerous, and were suspicious of M. Prunière's discovery. Since 1868 many prehistoric crania have been discovered in Europe, belonging to periods ranging from the Neolithic to that of the Roman occupation of France, which leave no doubt that trepanning was frequently and successfully practised amongst the ancient inhabitants of Europe for several thousand years before the birth of Christ. In 1876 Dr. Lucas-Championnière's attention was drawn to the subject; he showed that during the Neolithic period the *rondelle* of bone was usually removed from the cranial wall by encircling it with a series of perforations made by means of flint "borers." The eminent French surgeon has never lost his early interest in this subject, and during the present year he has issued a monograph[1] which gives a very clear account of the facts he has gathered and of the conclusions he has reached during the last thirty-six years on the operation of trephining as practised anciently and empirically. The operation in prehistoric times was not performed for fractures of the skull, but apparently for the relief of deep-seated pain in the head. In Dr. Lucas-Championnière's opinion, trepanning in prehistoric times represents the decompression operation, which is usually regarded as a triumph of modern surgery. "We too often forget," he writes, "in our vanity of modern science, that during thousands of years before our day men have observed and meditated." He regards these ancient inhabitants of Europe as the unknown and successful pioneers of modern cranio-cerebral surgery.

In ancient Peru the operation was often practised. At the congress of Americanists held in London last summer Dr. Julio Tello of Lima showed lantern slides of the great collection of trephined crania collected from the ancient cemeteries of Peru, and now preserved in the Warren Museum of Harvard University. The operation was often so extensive as to remove one-third or more of a parietal bone. The condition of the margin of the openings affords evidence of the surgeon's success; in some cases death must have followed before repair had commenced; in others the condition of the bone shows that the patient had recovered. No trace of trepanning has been found in the ancient crania of Egypt, India, or China. At the present day it is still practised by the natives of Polynesia, by the Kabyles of North Africa, and by the mountaineers of Montenegro. It seems to Dr. Lucas-Championnière very surprising that an operation which had so great a vogue in ancient Europe should have so completely disappeared as to leave no trace behind, and for many years he has sought for evidence of its survival in the more remote parts of European countries. The only instance which he regards as possibly a survival is to be found in Cornwall. In the BRITISH MEDICAL JOURNAL of July 21st, 1877, appeared an article by Dr. Robert Hudson of Redruth, describing how the miners of that district resort to the neighbouring surgeons to be trephined on their own initiative for injuries to the head incurred in the course of their work. Trepanning was then one of the commonest operations undertaken by the surgeons in Cornwall. Dr. Hudson attributed its popularity to the teaching of Mr. Pott of St. Bartholomew's Hospital, and to the practice of Dr. William Pyrce, a graduate of Edinburgh, who had a wide influence in Cornwall between 1760-1790. Dr. Lucas-Championnière, taking into consideration the antiquity of the mining industry in Cornwall and the remoteness of the county, thinks it just possible that the predisposition shown by the tin miners to undergo trephining may have resulted from the survival of a tradition which has come down from Neolithic times. A fragment of a human frontal bone recently discovered in the floor of a cave in the valley of the Wye, probably of Neolithic date, shows distinct evidence of an operation having been performed. Dr. Lucas-Championnière's contribution to the history of trephining will be welcomed in England, where it has always been a subject of interest and inquiry. A standard work on it was written by Dr. John Fletcher Horne[2] in 1894, and recently Sir Victor Horsley has made several contributions to our knowledge of this subject.

[1] *Trépanation néolithique, trépanation pre-colombienne, trépanation des Kabyles, trépanation traditionelle.* Paris: Steinheil. 1912. (Pp. 132; figs. 32.)

[2] *Trephining in its Ancient and Modern Aspects.*

THE INTENTIONS OF THE GOVERNMENT AS TO REMUNERATION.

THE consideration of the new proposals with regard to the remuneration of medical men in respect of medical benefit under the insurance scheme has not yet been completed by the Government, but we understand that the Chancellor of the Exchequer will make his statement early next week. The State Sickness Insurance Committee will be unable to complete its report until after the statement has been made, and the date of the quarterly meeting of Council has in consequence been postponed from October 30th to October 31st, at 10 a.m., when the report of the Committee will be considered.

A CRITICISM OF THE PUBLIC MEDICAL SERVICE SCHEMES.

As we go to press we have received a critical review of the public medical service schemes (A) and (B) proposed by the British Medical Association, printed for private circulation by Mr. M. St. L. Harford, L.R.C.P.I., and Dr. H. H. Mills (two of the medical members of the Advisory Committee selected by the Commissioners who have retained their seats on that body). Mr. Harford resides in the east and Dr. Mills in the west end of London. Both claim to speak as general practitioners, and it is to general practitioners that their pamphlet is addressed. It is something more than a critical review, for it concludes by stating that "it is difficult to imagine" that the influence of the proposed public medical service "on the public health would be beneficial," while they believe that "the cost would be prohibitive to those millions who, according to the report of the Poor Law Commission, are in urgent need of improved medical care. The Poor Law medical service has utterly broken down, and is condemned on every side. The British Medical Association, in the opinion of the writers, has signally failed to offer any practicable alternative. Its members must shortly decide whether they will accept service under the national scheme, which, with all its faults, offers the profession greater advantages and security than it has hitherto enjoyed." We are unable to follow the authors through their detailed review, but their first, and, as we understand, their chief criticism is contained in what they say with regard to Rules 1 to 10 of Scheme (A). They point out that though the scheme is intended to include many millions of people, the control of the organization is entirely in the hands of the profession, and express the opinion that a similar proposal for any other purpose would not be considered for a moment, since people who

supply the money generally expect to have some voice in determining how it should be spent. They argue that the amount of clerical labour, the number of offices necessary, and the co-ordination of the work of some twenty thousand doctors dealing with millions of people constitute a problem of the greatest magnitude, and they believe that only "a Napoleon of finance, with unlimited power and capital," could carry through such a scheme, and, even so, only if he had the law on his side. They contrast with the scheme the Insurance Act, under which the complicated machinery is provided and has already proved so costly that it has been the subject of a good deal of hostile criticism in the House of Commons. The question is, they say, Would the people agree to have no voice in the management of an enormous service provided from their contribution? The pamphlet criticizes the rules seriatim; with regard to 16 and 17, it is argued that the requirement that intending subscribers must apply would break down, and it is contended that only the fact that it is compulsory for employers to insure their workpeople has made the scheme of the National Insurance Act possible. The authors believe that under the Public Medical Service scheme there will be few subscribers until illness actually occurs. As regards the income limit, they accept the estimate by Mr. A. L. Bowley, Professor of Mathematics and Statistics in the London School of Economics and Political Science, founded upon inquiries with regard to some eight million adult male workers. The rate of wages earned by such workers was found to exceed 40s. a week in 13 per cent. only; the rate did not represent the actual earnings, which were less than the rate, since deductions had to be made for occasional lack of work, and loss of time from sickness, accidents, strikes, and holidays. Professor Bowley estimated that not more than 6 or 7 per cent. actually received on the average 40s. a week or more. The critics also dwell upon the cost of collection of the weekly premiums. The general result of the whole criticism is shown by the quotations at the beginning of this note. It has seemed well to give this brief abstract of the arguments of the pamphlet, but we must not be understood as in any way endorsing its conclusions.

CENTRES FOR THE TREATMENT OF SCHOOL CHILDREN.

ON May 16th the President of the Board of Education received a deputation from the British Medical Association with reference to the establishment of centres for the treatment of elementary school children. At that interview, as may be seen by the report of the deputation published in the SUPPLEMENT to the BRITISH MEDICAL JOURNAL of May 25th, Mr. Pease not only listened to the arguments advanced in favour of the establishment of these institutions, but promised to give the matter his favourable consideration. In the JOURNAL of October 5th (p. 900) the establishment of six treatment centres in the north, south, east, and west of London was noted. With those already in existence the number of such centres in the metropolis is raised altogether to a dozen. Some of these have been in existence for the last few years, and although the agreements are only for a year the fact that they are renewed year after year by the London County Council shows that the treatment of the children is being carried out to the satisfaction of the Government and the Council. The medical men in general practice who are to do the work at the new centres have been nominated by their fellow practitioners, and from those nominated the necessary number has been selected by the London County Council. We feel sure that they also will carry on their work to the satisfaction of the Council, to whom is given through appointed representatives right of entry to the centres. Doubtless as time goes on the Council, finding that the medical men working at these centres are successfully meeting the demands made upon them, will have little hesitation in arranging for other centres in the metropolis. As yet little has been done at these institutions for the dental treatment of the children, the delay in utilizing this important factor of child health being no doubt caused by the heavy expenses of such treatment. Now, however, the Council is beginning to see how needful it is for the ultimate health of the community that the children's teeth should be cared for, and it has, here and there, consented to a dental department being connected with these treatment centres. This is a step in the right direction, and in all probability at these newly established centres dental treatment will be arranged in the near future. The negotiations and arrangements for the establishment of these new centres have been very long drawn out, but at last they are in being. The Minister of Education and the London County Council are to be congratulated on this forward movement, and we sincerely hope that, having put their hands to the plough, they will not look back.

SLEEPINESS.

DR. FREDERICK TAYLOR, in his lecture before the Hunterian Society last week, discussed a subject—sleepiness so prolonged or quickly recurrent as to be pathological—which has received remarkably little attention. Dr. Taylor, after quoting some accounts of prolonged sleep in myth and fiction, and several instances of extreme sleepiness recorded in the public press and in medical literature, related two cases under his own care. In one these, a lady aged 48 suffered for years from constant drowsiness, associated with no other morbid condition than high arterial tension: no relief could be obtained from any kind of treatment, which included vaso-dilators and depletory measures, and she ultimately died of apoplexy. In the other case, a man aged 41, very fat, with a turgid, almost cyanosed face and high blood pressure, for some years experienced constant drowsiness, which subsided at length under some simple treatment. In discussing the causes of the somnolence in these cases, Dr. Taylor said that purely cerebral and nervous conditions, such as cerebral tumour, catalepsy, trance, and hysteria, could be excluded. The difficulty in finding an explanation was due, he said, to the very imperfect knowledge of the immediate cause of natural sleep, and he discussed some of the hypotheses which had been put forward. The two cases he had related could not be referred to overwork or fatigue or anaemia. Both had high blood pressure, but, though this was recognized and vaso-dilators were employed in treatment, no good results followed therefrom. Moreover, high blood pressure had been widely regarded as a frequent cause of the opposite condition—insomnia. On the other hand, temporary insomnia was certainly caused by mental excitement, which involved vasomotor paralysis and dilated vessels. The hypothesis that sleepiness is due to fatigue products or muscle poisons acting upon the cerebral tissues was next considered, and the toxic factor in the production of sleep by drugs like opium and alcohol was illustrated, and the less familiar instances of extreme sleepiness in various infectious diseases, such as septicaemia from local foci of disease, typhoid fever, trypanosomiasis, malaria, ankylostomiasis, and the drowsiness of autointoxication in gastric and intestinal disorders. The sleepiness observed in myxoedema and acromegaly was of great interest, because it gave the opportunity for an ingenious theory, which was advanced by Dr. Albert Salmon, of Florence, to explain not only these exceptional cases of drowsiness, but also the origin of sleep itself. The theory was briefly to the effect that fatigue poisons commenced to operate as poisons from the very moment of waking, but that they were neutralized wholly or in part by the internal secretions of the pituitary body, of the thyroid gland, and perhaps of other glands, the testes and ovaries. Excessive sleep might on this theory be the

result either of excess of fatigue products or of a defective secretion from the glands; the latter condition was illustrated by acromegaly, by myxoedema, during the menopause in some women, and by some rare cases of obesity and sleepiness combined. Dr. Taylor recorded a case of extreme somnolence in acromegaly complicated towards the end with albuminuria, but pointed out that drowsiness was not constant in acromegaly, and that in fact insomnia was sometimes present. From the therapeutical point of view, it was, he said, remarkable how few drugs there were for preventing sleep, or directly curing drowsiness. Of the drugs used in opium poisoning, such as potassium permanganate, atropine, and coffee, only the last was antihypnotic. The treatment of drowsiness was thus confined to the attempted removal of the cause, if this could be recognized. Vaso-dilators had not proved very successful; working upon Dr. Salmon's hypothesis, pituitary or thyroid extracts might be tried, but the cases were rare, and it was not possible to speak with confidence of the results until more experience had been acquired.

ANAPHYLAXIS AND REPEATED INJECTIONS OF SERUM.

A CORRESPONDENT has raised the practical question whether a repeated injection of serum in the form of diphtheria antitoxin undertaken after a shorter or longer period is attended with any real dangers and how such dangers can best be prevented or dealt with. This practical aspect of the anaphylaxis problem is unfortunately not yet cleared up. It will be remembered that von Pirquet and Schick analysed the symptoms which frequently follow the injection of serums, and came to the conclusion that the complex of rash, fever, and severe illness which is met with some seven to nine days after an injection is an anaphylactic phenomenon. Under ordinary circumstances the production of hypersensibility to a protein is induced by the repetition of the absorption of the same protein material, and is now ascribed to the rapid dissociation of the protein molecule. In actual practice very large numbers of human beings are subjected to injections of serum with a more or less considerable interval between the injections, and only a few have shown serious symptoms. A few deaths have been reported, notably the case closely investigated by Rosenau and Anderson. While recognizing that the future may reveal factors which are at present unknown, it seems at present justifiable to state that the chances of a dangerous fall in blood pressure resulting from a second injection of serum in the human subject are not great But it cannot be denied that some risk does exist. Another matter, on which the practitioner who employs diphtheria and other antitoxins, but who can scarcely find time to follow the bewildering literature on the subject, naturally needs information, is what measures can be taken to prevent the occurrence of the shock, or, if it occurs, to treat it. In the laboratory, anti-anaphylaxis can be induced, but how far this could be employed in human subjects has not been determined. A number of chemical substances, such as calcium choride, have been suggested for the purpose of avoiding the shock, but it appears extremely doubtful whether reliance can be placed on these preventive measures. Anaesthesia with ether holds out a much better promise, especially if the symptoms are recognized at the earliest onset and the anaesthetic can be applied at once. On the other hand, the physician may to a certain extent gather from the reaction to the first injection whether any special susceptibility is to be anticipated. If there is reason to fear that such is the case the renewed application of the protein should be small, but it may be repeated in larger amounts within a short time if a marked degree of anaphylaxis is not evidenced. It must further be pointed out that this applies with equal force to bacterial vaccines, tuberculins, etc. A hypersensibility to tuberculin may be produced by the disease itself, and this accounts for the damage which tuberculin has done when applied without precautions or control.

DR. LETTSOM AND THE MEDICAL SOCIETY.

MR. GEORGE BETHELL, Registrar of the Medical Society of London, has called our attention to the following passage in Mr. Walter G. Bell's *Fleet Street in Seven Centuries*: "Nothing of note is left of Bolt Court save No. 3. This picturesque eighteenth century building is quite unspoilt. It was the residence of Dr. John Coakley Lettsom, who in 1787 settled the Medical Society of London there. In 1790 he gave the house, which was his freehold, to the council; his other benefactions to the Society, of which he was a founder in 1773, and three times president, included funds and a library of books. The Society remained there until 1850, and one of the treasured possessions at their present premises in Chandos Street, Cavendish Square, is a painting by Medley of a meeting of the council in Bolt Court, at which Dr. Lettsom, a tall, spare figure, is presenting the title deeds. The canvas contains twenty-two portraits of medical men." Medley was the maternal grandfather of Sir Henry Thompson. Mr. Bell adds: "The Medical Society of London enrolled in its ranks all the distinguished physicians in the capital for upwards of a century, and honours the memory of its most illustrious founder by the Lettsomian Lectures delivered in its theatre. It still owns the old house in Bolt Court. Over the entrance is the Society's emblematic tablet, placed there by Lettsom himself. A ribbon bears the name. The central figure, standing in front of a pyramid, is the Isis of Sais, the revealer of the secrets of Nature, who presided over medicine; having discovered the virtues of healing plants, she is said to have invented it. The sphinx and the coiled serpent on either side of her represent eternity. Within the circle beneath is an inscription in worn Greek capitals, which, translated, reads: 'I am whatever is, or has been, or will be, and no mortal has hitherto drawn aside my veil.'" This is interesting to lovers of old London, but we are somewhat doubtful of the accuracy of the statement that the famous Quaker physician lived in Bolt Court. In Pettigrew's *Memoirs of the Life and Writings of the late John Coakley Lettsom* (London, 1817), it is stated (p. 50) that the Society "held its meetings in Crane Court, Fleet Street, until the year 1788, when Dr. Lettsom presented the Society with a freehold house situate in Bolt Court, Fleet Street, excellently adapted for all the purposes of the Society," etc. It will be noted that it is not said that Lettsom lived in the house, and as a matter of fact we find him (p. 102) two years earlier addressing a letter to "Mr. Urban," of the *Gentleman's Magazine*, from Basinghall Street. Some eighteen years later he writes to the Rev. J. Plumptre as follows: "About 20 years ago, a letter from the Indies, which came via Liverpool, having neither the city nor the nation of my residence, came safe to me. I do not mention it as a matter of analogy; but it is said that Boerhaave's Letters were sometimes directed to him in Europe; however, a Letter directed to me in London is sufficient; *my residence, really, is Sambrook Court, Basinghall Street.* The Camberwell postman lives in my lodge, that opens to Grove Hill; he has the residence for the trouble of opening the gate. I am rarely there, as my professional duties oblige me to remain a denizen of the metropolis." On November 1st, 1815, he died in the house in Basinghall Street, and Pettigrew relates that "hundreds of persons walked up Sambrook Court to view the mansion of its late owner in order to ascertain the truth of the report of his death." In an account of his own life, Pettigrew, who lived for several years in the house in Bolt Court as Registrar of the Society, says that Lettsom had given to the Society the freehold house in which its meetings were held. It is unlikely that if Lettsom had lived and practised there, Pettigrew, who was devoted to him, should not have mentioned the fact. The point is trivial, and we merely

submit it to Mr. Bell and Mr. Bethell for consideration. It may be mentioned that the emblematical figures, together with the Greek inscription over the door of the house in Bolt Court, also adorned Lettsom's country house at Camberwell, of which Boswell, who was a friend of Lettsom, sings:

> From terrace high he feasts his eye
> When practice grants a furlough;
> And while it roves o'er Dulwich groves
> Looks down—ev'n upon Thurlow.

Lord Chancellor Thurlow then lived at Dulwich.

CRAMP RINGS.

IN old times one of the customs on Good Friday was the hallowing by the King or Queen of England of rings which were held to be thereby rendered efficacious against cramp, the falling sickness, and similar complaints. The hallowing was attended with a special religious office, the complete Latin text of which is given by Burnet.[1] After some introductory prayers, the rings were placed in one or more basins, and blessed with many signs of the Cross. God was invoked to send the Holy Spirit into the rings and expel therefrom "all the evil of the livid and venomous snake." The last prayer contained a petition "that the rings might restore contracted nerves." Then, according to the formulary, "the queen's highness rubbeth the rings between her hands," saying, "Sanctifice, Domine, annulos istos," etc. The words of the prayer imply "that as her hands rub the rings, the virtue of the holy oil wherewith she was anointed might be infused into their metal, and by grace of God be efficacious." The ceremony was concluded by pouring holy water into the basins, and further prayers. The rings apparently were made of silver, sometimes of lead from the metal ornaments of old coffins; sometimes they were of black enamel with gold and silver ornaments. The belief in cramp rings still lingers in this country, and they may be bought in London at the present day. Not long ago on the way to Victoria Station we saw a number offered for sale for the reasonable price of 4s. 6d. It is easy to distinguish three elements in the treatment—the miraculous, the metallo-therapeutic, and the suggestive. They probably act as efficiently and in the same way as the potato—supposed to act more surely if stolen—which a good many people carry in the pocket as a prophylactic against rheumatism. That the blessing of the ring was, like touching for king's evil, looked upon as a prerogative of royalty, and therefore a test of true sovereignty, seems to be shown by the fact that Anne Boleyn, when Gardiner went to Rome in 1529, on a mission concerning the proposed divorce of Henry VIII, sent him on April 4th a number of cramp rings with the following letter: "Mr. Stephen, . . . I send you here the cramp rings for you and Mr. Gregory [Cassal] and Mr. Peters; pray you to distribute them both as *she* that (you may assure them) will be glad to do them any pleasure which shall be in my power. Written at Greenwich the 4th day of April By your assured friend Ann Bollein."[2] In connexion with this letter the question naturally arises how Anne in the year 1529 came by a sufficient number of cramp rings for Gardiner to distribute among the English Embassy to the Pope, if she had not at that time already taken upon herself the queenly office of consecrating them. The actual date of her marriage to Henry is uncertain, but is supposed to be about the beginning of 1533, though for reasons of public decency antedated to 1532. Benvenuto Cellini says cramp rings were imported into Italy from England in the sixteenth century. The use of rings as amulets against disease, however, was not confined to this country. Joan of Arc was said to have the names "Jesu Maria" inscribed on her ring which was a gift from a member of her family. Such rings were then common, and were believed to be prophylactics against epilepsy.

[1] *History of the Reformation.* Book II of the Records appended at the end of each volume. (Vol. ii, p. 295.)
[2] Strickland's *Lives of the Queens of England*, vol. ii. p 608-9.

RULE OF THE ROAD.

ELSEWHERE in this issue appears a letter from Dr. Mercier, in which the origin of the rule of the road is ascribed to a regulation made in 1722 in regard to vehicles traversing London Bridge. The suggestion is interesting, but possibly open to the objection that the making of this regulation does not necessarily imply that the rule thus established was entirely novel. Many generations often pass before authorities take it into their heads to convert a useful and well-recognized custom into a formal law or by-law. Even the rule of the road at sea, in some respects a much more important matter, did not possess any legal sanction until some fifty or sixty years ago. Dr. Mercier's suggestion that the choice of the left side of the road was not brought about by any consideration of convenience in driving, since the regulation spoke of east and west, not left and right, is open to the objection that the upholders of the English rule have always maintained that it is the physiological or natural rule, and was especially convenient at a time when four-horse teams and tandems were in vogue. The object of drivers when meeting is to keep well away from one another, and, since all drivers hold their reins in the left hand, it is easier to keep away if the right hand remains free to bring the whip to bear, if need be. This advantage is so marked that it seems quite probable that it must have been recognized quite early in the history of vehicular traffic. In any case, the rule of "keep to the left" is by no means limited to these islands, America, Canada, and Australia. In fact, the only purely "keep to the right" countries are, we believe, France, Germany, Belgium, and Holland. In many parts of Italy the rule is "keep to the left," and this is the case throughout the greater part of Austria and the whole of Switzerland. From the point of view of foot passengers, an equally important rule is that relating to the side to which vehicles must keep when overtaking and passing those travelling in the same direction. In Great Britain the rule is to keep to the off, or right-hand side—that is, the one furthest from the pavement; while in some foreign countries where the left-hand rule prevails in respect of meeting vehicles, the same rule applies to overtaking vehicles—that is to say, the faster moving vehicle passes the slower one on the side next to the footpath. In some respects this is the better rule for foot passengers, since it is very awkward and dangerous when one has crossed in front of a dray or other slowly moving vehicle to find one's progress endangered by a previously hidden and rapidly moving taxi.

COMMITTEE ON INDUSTRIAL DISEASES.

THE Departmental Committee appointed last April to consider whether cow-pox, Dupuytren's contraction, and clonic spasm of the eyelids apart from nystagmus should be added to the third schedule of the Workmen's Compensation Act, met at the Home Office on October 12th; Mr. Ellis Griffith, M.P. (the chairman) presided. The other members of the committee are: Sir T. Clifford Allbutt, F.R.S., Mr. A. H. Ruegg (County Court Judge, Staffordshire, and Joint Judge for Birmingham), and Dr. T. M. Legge (Medical Inspector of Factories). Evidence was given by Dr. E. L. Collis (Medical Inspector of Factories) as to the occurrence of Dupuytren's disease among minders of lace machines, a matter with regard to which he and Mr. Eatock (H.M. Inspector of Factories) have recently conducted inquiries and made a report to the Home Secretary. This report, which has just been issued,[1] contains a brief examination of the literature, from which it is concluded that Dupuytren's contraction may be congenital or may be caused by definite injury or chronic and localized pressure. The several branches of the lace trade and the machines used are then considered

[1] Home Office—Dupuytren's Contraction. London: Wyman and Sons. (6d.)

and described, and the results of the examination of 139 cases of the disease among operatives in the trade are analysed. The contraction definitely followed upon accidents in 14 cases only. The statistics are compared with those obtained from an examination of a somewhat large number of persons engaged in making tinplates and dressing granite, and the result appears amply to support the conclusion that Dupuytren's contraction is more than usually prevalent among lace machine minders. The other conclusion of the report is that this prevalence has a direct relation to the frequency with which the levers and wheels of the machine are manipulated, and the power required to actuate these levers and wheels and their size, shape, and position. Certain suggestions are made for improvements in the construction of the machines, which, it is believed, would tend to prevent the prevalence of the disorder. The committee will also take evidence as to the occurrence of the disease in trades other than the lace trade, and any communication with regard to the matter should be addressed to the Secretary of the Committee (Mr. Arthur Locke), at the Home Office. Additions to the schedule of diseases under the Workmen's Compensation Act, 1906, were made in 1907 and 1908, and the question for the committee is whether the three conditions mentioned, or any of them, should be added to the schedule, so as to enable workmen so disabled to claim compensation if the disease be due to the nature of the employment.

MEDICAL MEN IN THE DICTIONARY OF NATIONAL BIOGRAPHY.

The second volume of the second Supplement to the *Dictionary of National Biography*, a brief review of which was published in our issue of October 5th, p. 884, shows, as was then said, a fair proportion of medical men; the actual number seems to be 39 out of the 384 lives dealt with. The number of medical lives approximates very closely with that found in the first volume (38); and it may be taken that, speaking roughly, one in every ten names in this national Valhalla is that of a physician, of a surgeon, or of one possessing a medical or surgical education. In this volume there appears one man whom medicine might well claim, for he practically founded the department of laryngology; we refer to Manuel Garcia, who invented the laryngoscope in 1854, and made known the invention in 1855. Exactly fifty years later, on his 100th birthday (1905), Garcia, who had for more than half a century been premier singing teacher in the world, received many honours, and was entertained at a banquet in London which was attended by many distinguished persons. But if Garcia, who was not a doctor, did much for medicine, Sir Francis Seymour Haden, who was a surgeon, and who also had a long life (dying at the age of 92), did much for art by his work in etching. If we analyse the departments of medicine to which the thirty-nine men in this volume devoted themselves, we find that ten were surgeons, including such names as Sir Thomas Fitzgerald, Mr. Christopher Heath, Mr. Luther Holden, Mr. Timothy Holmes, Sir William MacCormac, and Mr. Edward Mapother; there were also four surgeons-general, including Sir James Hanbury and Sir William Guyer Hunter; and one Inspector-General of Hospitals and Fleets (Sir John Macdonald); eight were physicians, including Sir William Gairdner, Sir Alfred Garrod, Dr. Samuel Gee, Dr. Hughlings Jackson, Dr. W. W. Ireland, and Sir Stephen Mackenzie; three were botanists, including Sir Joseph Hooker and Sir George King; two were gynaecologists (Sir Arthur Macan and Dr. More Madden), and two were physiologists (Sir Michael Foster and Dr. Gamgee); while the following specialities claimed one each, namely, ophthalmic surgery, veterinary surgery, tropical diseases (Sir Joseph Fayrer), bacteriology, pathology (Professor Hamilton of Aberdeen), and lunacy (Sir Arthur Mitchell). Many of the lives make interesting reading, although no one is treated at great length. Surely none had a more adventurous life than Dr. W. W. Ireland, the son of a publisher in Edinburgh and a descendant of John Knox through his daughter, Mrs. Welsh. He was born in 1832, and in 1856 was appointed an assistant surgeon in the East India Company's service; he was present at the siege of Delhi, where he treated the wounds of Lieutenant (now Lord) Roberts. Ireland was wounded by a bullet which destroyed one of his eyes and passed round the base of the skull to the opposite ear. In the Army List of casualties for 1858 his named appeared as "killed before Delhi, August 26th, 1857," but he was alive more than fifty years later. Dr. Ireland is perhaps best known by his fascinating works on psychology in relation to historical personages (such as Mohammed, Joan of Arc, and Swedenborg); *The Blot on the Brain* and *Through the Ivory Gate* may be specially named. Two misprints occurring in the life of Dr. Allan Macfadyen, the bacteriologist, who died from an accidental infection with Malta fever and typhoid, may be noted; it is stated that he married the daughter of Professor Cartling of Dettingen, but it ought to be Professor Bartling of Göttingen. With respect to birthplace, the thirty-nine medical lives are thus distributed: England, 18; Scotland, 9; Ireland, 8; Canada, 1; Europe, India, and West Indies, 1 each. It is more difficult to allocate to each the medical school or university at which he was educated, for in several instances the student's training was begun in one school and ended at another. Speaking generally, the London Schools and Edinburgh University lead the way with 20 and 9 respectively, whilst the remaining names are divided between the Irish schools and the Universities of Aberdeen and Glasgow.

PLAIN TALK ON READING.

The public is accustomed to be lectured on reading by more or less eminent persons. The advice is generally to the effect that only the "best" should be read, and to help us to choose the "best," lists are from time to time compiled. The eminent persons of course think it due to themselves to recommend only those books which no gentleman's library should be without, and which, as a general rule, no possessor of such a library reads. There is far too much cant on the subject of reading. Did not Macaulay, one of the greatest of readers, say that very few and very weary are those who toil through the *Faërie Queene*, and are in at the death of the Blatant Beast—an unlucky remark, which seems to show that he himself had never read Edmund Spenser's great poem to the end. Except Shakespeare, who but professors and critics, whose business it is to know something about them, reads the Elizabethan playwrights? How many could lay their hands on their hearts and say they had read *Paradise Regained?* Most, we fear, if they dared to speak out, would say with Thackeray, "Oh, yes: Milton, a great poet of course, but such a d——d bore that no one can read him." How many people have read Plato even in Jowett's translation? After the customary displays of artificial enthusiasm about classical writers it is refreshing to find Lord Rosebery giving his views as to the choice of books with characteristic frankness. At the opening of the Carnegie Institution at Peebles on October 9th, he said he supposed some people would say that the standard books were the "hundred best books" which competent gentlemen were so ready to furnish; as to these he hinted a doubt whether they had always read them themselves. He believed that if a man in honesty and conscience proceeded to read the hundred best books in any list right through, he would never wish to read anything again. The best literature for everybody was that which he could assimilate and digest. It was, he said, an enormous mistake for

people to toil through masterpieces of literature without caring for them or understanding them, and feel they had done a virtuous act when they had completed them. Every one must find out for himself the books that suit his mental digestion. Many great people said they took pleasure in the novels of Richardson. He hoped they told the truth. For his part he found the best of them the most unspeakably dreary thing he ever had to wade through. On Lord Rosebery's remarks about Richardson we will say nothing, because we confess we have never been able to read the little printer's novels which made the ladies of the eighteenth century cry so much. As Dr. Johnson said, if a man were to read Richardson for the plot he would hang himself. Yet we know how popular they were with the author's contemporaries, and how men like Diderot and other good judges in France spoke of him. For the rest we entirely agree with Lord Rosebery. The great writers are all very well in their way, and the appeal of Shakespeare is universal and eternal. Yet we know that Charles Darwin, who had been a great admirer, lost the taste for him in his later days and subsided on common novels. This, we take it, was a case of exhaustion of the æsthetic sense by intense devotion to observation. Novels have been the mental recreation of other great men. A very distinguished physician not long dead used to read the yellow-backed volumes, so common a few years ago, in his carriage on his rounds, tearing out and throwing out of the window the pages as he finished them—a waste of material that might have gone to soothe the weary hours of convalescence in hospitals. Napoleon always carried with him a travelling library of some 3,000 volumes, including a large proportion of fiction. He was an impatient reader, and if after a glance or two a book did not please him, he threw it out of his carriage window, his devastating progress through Europe being thus marked by bad novels. For recreation, the literature best adapted to the intellectual digestion of most people is wholesome fiction; but, as Lord Rosebery said, one has to wade through a great quantity of fiction before finding what one wants. The modern novel in which medicine of a kind plays a large part is an abomination. Zola got details of diseases for his realistic descriptions from medical books which he often misunderstood. Flaubert, who was the son of a distinguished surgeon, was careful to have his medical descriptions corrected by professional friends. It is a curious fact that medical men are often inaccurate in their scientific details. We hold with Mr. Balfour that literature should be cheerful, and on that account most healthy minds find the whole class of so-called realistic novels distasteful. For doctors, the novels most likely to take the mind furthest away from the harassing cares of the daily task are unquestionably the best. Of course, the nearer they approach the highest standard of literature the better, but many, perhaps most, readers prefer books in which the meaning is not obscured by painful elaboration of style.

THE LINNÉ LETTERS.

THE University of Upsala, subsidized by the Swedish Government, has now issued the fourth part, vol. i, of the correspondence between the Swedish naturalist and his friends. Reviews of the earlier parts of this correspondence have appeared in the JOURNAL (December 24th, 1910, p. 1978, and December 23rd, 1911, p. 1661). The present volume[1] contains much that is interesting and humorous. The letters written by Linné are full of requests for botanical specimens and information. In this respect his letters closely resemble those of John Hunter, and both appear to have accumulated a mass of zoological observations from their correspondents, the substance of which was more suited for the novelist than the scientist. A clergyman writes to Linné of the wonderful medicinal properties of the plant *linnea*. He collected the stalks and leaves and dried them during the winter. Hearing of a man who had been confined to his bed for many months by rheumatism in all his joints, in his head and stomach, the pastor sent the patient a large quantity of linnea with directions how to brew a decoction from it. They were misunderstood, and the whole quantity of linnea was taken in one dose. The patient felt very drunk and went fast asleep. On waking, he found his pain had vanished and that he could get out of bed. The cure was complete and permanent! Many other cases of rheumatism were cured by the worthy pastor in one to four days. The same writer also relates how he and four other clergymen were present at a wedding where a fifteen-year-old girl suffered from such severe oedema of the legs that each limb was thicker than the body. None of the other clergymen could suggest a remedy, so the writer gathered a quantity of linnea, dried it by the fire, and made a decoction which the patient drank of, while in another portion of it her feet were plunged. Intoxication ensued, the girl beginning to dance by herself; but she was completely cured on the same day. Linné appears to have scoured the whole world for matters of interest, judging by the number of countries from which his correspondents sent him news. A friend in Constantinople writes him a long dissertation on phosphorescence in sea-water and its source, which he traces to slimy bodies, such as *Medusa verrucosa*, and not to the salts in sea-water; for the latter pass through filters, and the filtrate is no longer phosphorescent. Another correspondent writes from Edinburgh about the professors in medicine. Dr. Home, Professor of Materia Medica, is reported to have but a small following, for his lectures contain so many marvellous theories, and his accounts of different cases are too wonderful to be believed! Another sufferer from marvellous theories is Lord Monboddo, who, "though really learned, believes that primitive man had a tail, walked on all fours, and could not speak." This letter is dated February 28th, 1773.

[1] *Bref och Skrifvelser af och, till Carl von Linné.* Vol. I. Part 4. Edited by T. M. Fries. Stockholm Aktiebolaget Ljus. 1912. (Roy. 8vo, pp. 445. Price Kr. 10.)

IT is stated that the Nobel Prize in Medicine for 1912 will be awarded to Dr. Alexis Carrel, of the Rockefeller Institute, in recognition of his researches on the transplantation of organs.

THE first ordinary meeting of the recently constituted Section of Psychiatry of the Royal Society of Medicine will take place at the house of the Society, 1, Wimpole Street, W., on Tuesday next, October 22nd, at 8.30 p.m., when the President, Sir George H. Savage, will deliver his address.

CONSIDERABLE progress has recently been made in the organization of the Australian Institute of Tropical Medicine at Townsville, Queensland. Dr. W. Nicoll, of the Lister Institute, and until recently Ernest Hart Scholar of the British Medical Association, has been appointed chief assistant; Dr. Priestley, Beit Memorial Scholar, an Australian graduate who for the last year has been working at the Lister Institute, has been appointed second assistant; and Dr. Young, assistant chemist at the Lister Institute, bio-chemist.

AT the invitation of the Lord Mayor of London a meeting will be held at the Mansion House on Wednesday next, at 2.30 p.m., to take steps for raising a fund to establish a memorial to Lord Lister. The meeting will

be addressed by the Prime Minister, Lord Avebury, the President of the Royal Society, the President of the Royal College of Surgeons, and the Hon. W. F. D. Smith. The offices of the committee to promote the memorial are at the rooms of the Royal Society, Burlington, London, W.

Medical Notes in Parliament.

[From our Lobby Correspondent.]

National Insurance Act.

Compensation and Medical Benefits.

Mr. Sutton asked whether, in the event of an employed contributor suffering an accident whilst following his employment, for which he received compensation to an amount which precluded him from sickness benefit, he would be entitled to medical benefit. Mr. Masterman replied that the answer was in the affirmative.

A Select Committee on Medical Remuneration.

Sir Norval Helme asked the Chancellor of the Exchequer whether, in view of the general desire throughout the country to secure a settlement of the scale of remuneration for medical services under the National Insurance Act, he would consider, on request being made, the appointment of a Select Committee to take evidence and report to the House as to what would be adequate remuneration for the doctors. Mr. Lloyd George said that he was obliged for the suggestion, but he feared that it would hardly be possible for a Select Committee to complete its investigations and issue its report in time to enable him to make effective use of the report before January 15th.

Isolation Hospitals used for Tuberculous Patients.

Mr. Hume-Williams asked how many isolation hospitals in the country were, or were going to be, used in pursuance of the National Insurance Act for the reception of tuberculous patients; and what, if any, arrangements were being made in such cases to provide accommodation, in case of an outbreak of infectious disease, for those who had to be at once isolated, and for whom the hospitals were constructed. Mr. Burns said at present thirty-eight isolation hospitals in England and Wales had been approved for the purpose of providing treatment for insured persons suffering from tuberculosis. It was not possible to say what number might be hereafter approved, but in all cases the necessity of having suitable arrangements for dealing with outbreaks of other infectious diseases would be kept in view.

Choice of Doctor.

Mr. C. Bathurst asked whether it had been decided by the Insurance Commissioners that insured persons who were members of approved societies would be deemed to have exercised their free choice of a doctor if they had agreed, as a condition of membership, to abide by the decision of the majority of their society or club; and, if so, whether, in view of the prevailing ignorance on the matter among members of approved societies, the Commissioners would make known this decision through the public press. Mr. Masterman replied that the Insurance Commissioners had not come to any such decision as was suggested in the question. Every insured person had a right individually to select any doctor on the panel or to obtain medical treatment in some other manner, and this right was fully preserved by the Regulations, which provided that the appropriate forms of application should be filled up by the insured person.

Sanatorium Benefit.

Mr. Royds asked whether, under the provisions of the National Insurance Act, no sanatorium or other benefit was available for consumptives suffering from that disease at the date the Act came into operation; and whether such benefits were confined to persons actually employed at that date and attacked with the disease afterwards. Mr. Masterman answered that any insured person was entitled to sanatorium benefit if the Insurance Committee recommended the case for such benefit, whether he was suffering from tuberculosis before or after the Act came into operation; but no person was entitled to become insured under the Act unless he was either employed within the meaning of Part I of the Act or engaged in some regular occupation and wholly or mainly dependent for his livelihood on the earnings derived by him from that occupation.

State and Society Contributions.

Mr. Robert Harcourt asked whether in certain lodges of friendly societies a large proportion of existing members were paying the State Insurance contribution in addition to their existing contributions to the society, thus voluntarily paying at least 10d. a week in order to secure, *inter alia*, sickness benefit of 22s. a week; whether this practice was general; and whether any figures could be given? Mr. Masterman said that he understood that very many members were choosing to continue their previous voluntary contributions in addition to their contributions under the Act. He was unable, however, at present to give any exact statistics showing the extent of such voluntary insurance outside the Act.

County of London Insurance Committee.

Mr. Davison Dalziel asked the Secretary to the Treasury if he was aware that the acting clerk of the County of London Insurance Committee received on or about August 30th last an application for sanatorium treatment from Mr. G. Akers, a member of the Lorne Lodge of the Manchester Unity of Oddfellows Approved Society, No. 123, and on or about September 15th a similar application from Mr. H. Weatherstone, also a member of the Lorne Lodge of the same approved society; and would he say whether either of the above-mentioned applicants had received sanatorium treatment, and, if not, what was the cause of the delay. Mr. Masterman said that he was informed that in neither of these cases was treatment in a sanatorium recommended as suitable by the medical adviser to the committee, and that both were now receiving the treatment recommended by him.

Medical Benefit.

Mr. Lansbury asked the Secretary to the Treasury, with reference to the provisional regulations as to the administration of medical benefit made under the National Insurance Act, and dated October 1st, 1912, whether it was intended that each local insurance committee should fix each year a total sum to be paid for medical benefit, which was not to be exceeded, and out of which the payments for ordinary medical treatment, the payments for special services by the doctors, and the payments for drugs and medicines were alike to come; whether it was intended that, when a capitation fee or a rate of payment per visit had been agreed on, the medical practitioner would not necessarily get that fee or that rate, but only such a proportion thereof as the total sum arbitrarily fixed by the local insurance committee for the various items of expenditure would allow; whether he was aware that, under such circumstances, the medical practitioners would find themselves getting a smaller annual remuneration whenever the sickness of the year had necessitated a larger outlay on drugs and medicines, so that, for instance, when an influenza epidemic involved more quinine than usual, the medical practitioners would find their incomes reduced; whether he was aware that such an arrangement was in contravention of the spirit of Section 15 (5), proviso (ii), which was intended to prevent the medical practitioner from having any pecuniary interest in stinting the supply of expensive drugs; whether he was aware that the arrangement was calculated to restrict the calling in of consultants in serious cases, as the cost of their fees would, in effect, have to be borne by the ordinary medical practitioners themselves; whether he would explain on what basis the local insurance committee could, or would be instructed or advised to, fix the total sum to be paid in respect of medical benefit if, as explained, this was expected to be less than the aggregate of the sums payable to the medical practitioners for fees and extras at agreed rates and for drugs and medicines at agreed prices; and whether he would arrange that the House should have an opportunity of discussing the terms to be made for medical benefit before these were approved by the Commissioners.

Mr. Masterman said that the draft regulations now before Parliament could not be interpreted except in connexion with the general question of remuneration for medical benefit under the Insurance Act. This question was still under the consideration of the Government, and the Chancellor of the Exchequer hoped to make an announcement on the subject in the immediate future.

Mr. Oliver Locker-Lampson asked the Chancellor of the Exchequer if he would state how much additional money would be required to pay the doctors under the National Insurance Act 8s. 6d. per head instead of the sum originally decided upon. Mr. Masterman answered that if by the sum originally decided the hon. member meant the sum of 6s. per insured person in the original actuarial estimates as the cost of medical benefit, the additional sum required to raise the 6s. to 8s. 6d. would be approximately 1½ million a year.

Provisional Insurance Committees.

Mr. O'Grady asked the Secretary to the Treasury whether, in view of the fact that the time for meeting of many of the provisional health committees would necessitate a financial loss to the working-men members of those committees, steps would be taken to recompense them for the loss sustained, as was done in connexion with the Labour Exchange advisory committees. Mr. Masterman replied that, as he stated on July 24th, the Insurance Committees could pay railway fares in counties for any members of committees, and, were doing so in a number of cases. He was afraid, however, that in this case, as in that of other similar administrative public bodies with executive power, it would be impossible to arrange for payment for loss of time.

Sleeping Sickness Commission.—Sir J. D. Rees asked the Secretary for the Colonies whether the whole expenses of the Sleeping Sickness Commission had been or would be debited to Nyasaland; and, if the answer was in the affirmative, whether he would consider the advisability of spreading the cost over other administrations which would share the benefits resulting from these researches. Mr. Harcourt said that the answer to the first part of the question was in the affirmative. He saw no sufficient ground for spreading the cost over other administrations which had incurred and been incurring expenditure in connexion with their own sleeping sickness problems. He hoped that all the researches carried out in different parts of Africa would be for the benefit of the whole.

Vivisection.—On October 11th, when the debate on the Marconi contract was finished, a few minutes before 5 p.m., Sir F. Banbury seized the opportunity of moving the Dogs Protection (No. 2) Bill. Mr. Booth at once pointed out that the bill dealt with a very important matter, and ought not to be passed without due deliberation by the House. At this point a Member called attention to the few members in the Chamber and the House was counted, and forty members not being present the adjournment took place and the bill made no progress.

Hospital Accommodation at Rosyth.—In answer to a question put by Mr. Booth, Dr. Macnamara said that as regards hospital accommodation, there was ample provision for rendering first aid. Two doctors were retained, one of whom was always at his surgery, about two and a half miles from the works, or within call; the other could reach the works in a few minutes by motor car. Hand stretchers and two fully equipped railway hospital wagons capable of holding twenty-six injured men on stretchers were kept on the works. For serious accident cases the Dunfermline and Western Fife Hospital, distant three and a half miles from the works, was available. Fifty-eight cases of injury had been admitted since the commencement of the contract. The hospital contained over sixty beds, and had never had to refuse a case from Rosyth Works. Contractors made a contribution to the funds of this institution. There was also the local Poor Law infirmary, an admirably equipped hospital, and also suitable infectious accommodation provided by the local authorities.

House of Commons (Ventilation).—Sir J. D. Rees asked whether the Commissioner of Works had read the address of Mr. Leonard Hill, as president of the Physiological Section of the British Association, in which he explained how deadly was uniformly heated air, how necessary perceptible movement and changes of temperature, how injurious were the effects of a still, close, equable atmosphere; and whether he would take steps to alter the present system of ventilation of the House so as to bring it more in accord with these sanitary principles. Mr. Wedgwood Benn said that the ventilation of the Chamber had been the subject of several inquiries by Committees between 1902 and 1906. Over £5,000 had been spent in carrying out the recommendations of those Committees and the reports of Dr. Mervyn Gordon. The air in the Chamber was constantly in movement and was changed about six times an hour. A uniform temperature was maintained. The First Commissioner was not of opinion that any alteration in the ventilation system would be desirable.

Tooting Crache (Deaths).—Dr. Chapple asked whether any of the infants which had recently died in a crêche at Tooting were children to whom the proviso to Subsection (1) of Section 1 of the Children Act, 1908, applied; whether there were now in that crêche any children to whom that proviso applied; and what visits of inspection had been paid since the crêche was started. Mr. McKenna said the answer to the first part of the question was in the negative. He was informed by the London County Council that in each case the reception of the infants in the home was duly notified. The home was started in June, 1912, and the superintendent was informed by officers of the Council as to the precautions to be taken and as to the grave risk she ran in establishing and carrying on the home, and she was warned not to receive many young infants. The Council's inspector visited the home on a number of occasions, on none of which was any condition found which would have enabled her to take action for the removal of the infants under Section 5 of the Act. The inspector was assured that the home was under medical supervision, and that in the event of illness a doctor would be instantly available. All the surviving infants had been removed from the home. Dr. Chapple pressed the matter further by asking the Prime Minister whether his attention had been drawn to the reports of the deaths of four infants within a week in a babies' home in Tooting, where none of the nurses in attendance were qualified; and what steps, if any, he was prepared to take to ensure that protection to the sick which in many other countries was provided by the State registration of trained nurses. Mr. McKenna said that the Prime Minister had asked him to answer this question. His attention had been called to the reports, and he had been in communication with the London County Council with regard to the case. The home was a crêche, not an institution for sick children, and the persons described as "nurses" were not sick nurses, but the ordinary attendants on the children. The case was a serious one, but he did not think it had any direct bearing on the question of the State registration of nurses.

ACCORDING to the *Medical Record*, during the year 1911 small-pox was again prevalent all over the United States, but for the most part in a very mild form. Severe outbreaks of the disease during the year were limited to Texas, California, and Kansas, and were few in number. Reports from twenty-nine States and the District of Columbia give a total of 21,768 cases during the year and 134 deaths reported. In 1910 there were in these same States 25,598 cases, with 403 deaths. The greatest number of cases were reported from North Carolina, 2,484; Florida, 2,195; Kansas, 2,043; Utah, 1,660; and Colorado, 1,381. In Connecticut only 2 cases were reported during the year. The case fatality was, on the whole, very low, the average rate being only 0.61 per 100 cases. In Massachusetts, however, there were 11 cases with 2 deaths, giving a fatality-rate per 100 of 18.18, the highest reported. In Texas, where many more cases of the disease occurred, the rate was 7.42, and in California 5.4 per 100.

England and Wales.

[FROM OUR SPECIAL CORRESPONDENTS.]

WEST YORKSHIRE.

HALIFAX AND DISTRICT MEDICAL SOCIETY.

THE opening meeting of this society was held at the Royal Halifax Infirmary on October 8th. The president, Dr. T. H. Hunt, gave an interesting address in which he dealt with various facts, cases, and theories which had been the most striking landmarks in his own professional experience. The profession was growing, he said, in a scientific direction. Medical men aimed at earning their living more by the sale of professional knowledge, and less by humouring and amusing their patients. They were less and less unwilling to confess their ignorance of cases or their inability to effect a cure. Dr. Hunt then treated in quick succession many changes and improvements in the domain of medicine. Referring to phthisis and the open-air treatment, which had gained so much in popularity, he thought signs were not wanting that a reaction was setting in. There was some factor not fully recognized yet in the causation of phthisis besides the tubercle bacillus and lack of fresh air. In therapeutics and materia medica the standardization of drugs had effected a great change, but nothing was more remarkable than the way in which synthetic preparations had multiplied. The *x* rays had led to a great advance both in diagnosis and treatment, but care was required, as in recent times a broken leg had been sent away as unfractured because the fracture line in the skiagram was so faint and regular that it was missed. The transference of the normal widwifery case to the care of the midwife was a change he did not regret. Sitting by the bedside of a parturient woman was not, he thought, a very dignified proceeding befitting a scientific man, and in few cases did the fee repay the time and disturbance to other work. As a medical officer to the education authority he was able to speak of that work with considerable confidence. More than half the cases of defective vision and hearing, otorrhoea, ringworm, and impetigo were neglected by parents, notwithstanding warning notices from the education authority. There were hospitals ready to treat the poor cases gratuitously, and yet the parents would not trouble to take them. In connexion with this work, and within the last few years, open-air schools had been provided (of which there was an excellent example in Halifax) in suitable surroundings. They would all agree, he thought, that school sanatoriums, with diminished book work, marked a great forward movement in educational hygiene. In the domain of surgery there was a striking advance, as shown in the increasing number of surgical operations, and in the improved diagnosis, especially in abdominal work, and the great diminution of suppurating cases. Taking the reports of the Royal Halifax Infirmary, a comparison between 1897 and 1911 showed that the number of major operations had increased from 230 in the former to 630 in the latter year. In 1897 the appendix was not mentioned, except as one case of typhlitis. In 1911 there were 120 of these cases, 30 of which were complicated by general peritonitis. Of these 30 cases 50 per cent. were cured, a result which would have caused amazement twelve years ago. The statistics for radical cure of hernia were also very instructive. In 1900 there were 24 cases, in 1911 75 cases, showing how much more popular operation had become in these cases. It was interesting to trace the course of fashion. He could not remember the days of the carbolic spray, but he did remember when everything had to be soaked in carbolic. Then came the stage of sterilization by boiling and the use of sterile water for lotions. Now much of the ritual of skin cleansing by soaps, brushes, and compresses was simplified by merely painting with iodine. A hearty vote of thanks was accorded to Dr. Hunt at the conclusion of his interesting retrospective address.

Annual Dinner.

The Halifax and District Annual Medical Dinner was held at the White Swan Hotel, Halifax, on October 10th. There were sixty-four present. Dr. Drury was Chairman. Among the guests were Dr. Wilkinson (Manchester), Drs. Wardrop Griffith, Whitehead, and Watson (Leeds), Dr. Hillman (Castleford), and Dr. Little (Bradford). A significant notice appeared on the inner leaf of the menu card. It was in the following terms: "On this occasion the Red Cross Flag will be hoisted over the Right Hon. Lloyd George and the Insurance Act." Considerable amusement was caused by the dexterous manner in which the speakers skirted round these topics without much infringement of the temporary regulation. Dr. N. Perrin Brown proposed "Our Guests," coupled with the names of Dr. Wilkinson and Dr. Hillman, who replied. Dr. J. Oakley, J.P., in felicitous terms proposed "The Chairman," and alluded to his keen work in many directions. The tributes were endorsed in a "bumping" toast with musical honours. Dr. Drury appropriately replied. With controversial topics in the background, the speeches were bright and humorous. A great share in the evening's enjoyment was provided by the musical programme. The vocalists were highly appreciated, and the humorist evoked roars of laughter. Mrs. Drury acted as accompanist, and was also one of the vocalists. A special vote of thanks to her was proposed by Dr. West Symes, and heartily supported.

MANCHESTER AND DISTRICT.

THE TUBERCULOSIS SCHEME IN SALFORD.

ON October 10th a deputation representative of the Provisional Medical Committee for Salford met the Joint Committee of the Health and Provisional Insurance Committees at the Salford Town Hall to discuss the scheme put forward by the Corporation for giving sanatorium benefit. The deputation consisted of Drs. Bradley, Fletcher, Hodgson, J. H. Taylor, and Waltenberg. The scheme had been laid before the last meeting of the Town Council, but at the request of the medical members of the council had been postponed in order to give medical practitioners an opportunity of considering and commenting on it before it received the sanction of the council. The object of the deputation was to elicit information on details of the scheme, and, if possible, to obtain assurances as to its practical working in several important particulars. Anxiety had been expressed that the proposed tuberculosis dispensary might be used as a general out-patient department at which patients suffering from tuberculosis would be under some compulsion to attend as a condition of being recommended for sanatorium benefit. It is understood that assurances were given that treatment at the dispensary would only be given after consultation between the tuberculosis officer and the private medical attendant, and that when it had been agreed in consultation that domiciliary attendance should be given patients would be at liberty to choose their own private medical attendant. The deputation obtained further information on other points, and will now report to the Provisional Medical Committee, which will decide as to the future action of the local profession. In the meantime the Joint Committee is offering the scale of fees sanctioned by the British Medical Association for visits, consultations, injections of vaccine, and reports; but until a working agreement has been arrived at between the Joint Committee and the profession, practitioners have been advised not to make individual arrangements with the committee, but to deal with the patients themselves directly.

BIRMINGHAM.

THE BIRMINGHAM DISPENSARY AND TUBERCULOSIS.

FOR some time the authorities of the Birmingham General Dispensary have had under consideration the question of providing special treatment for phthisical patients. Upwards of 1,200 tuberculous cases have annually come under the notice of the dispensary medical officers, and the problem of their treatment has proved perplexing, for the majority, being breadwinners, were not in a position to undergo treatment at a sanatorium.

Arrangements have been made to establish a tuberculosis dispensary in Great Charles Street, which will be in charge of a medical officer, who will devote the whole of his time to this work. Dr. Alfred E. Carver has been appointed to this office. The arrangements are that the resident medical officer of the Birmingham General Dispensary in each district will refer all cases which appear

suitable for tuberculin treatment to Great Charles Street. Where necessary the medical officer, accompanied by a nurse, will visit patients at their own homes to see that his instructions are carried out. The medical officer will be assisted by two nurses, and it is estimated that the annual cost of the new department will be slightly under £1,000.

HOSPITAL TREATMENT OF PUERPERAL SEPSIS.

At the last meeting of the Management Committee it was reported that £3,933 had been received or promised towards the appeal for £6,000 to extend the septic ward at the Birmingham and Midland Women's Hospital. Ten beds have been for some time reserved exclusively for septic cases, and in April, 1911, an arrangement was entered into with the City Health Committee to deal with cases of puerperal fever notified to the medical officer, and two beds were set aside for these cases. The work increased rapidly, and though the number of reserved beds has been raised from two to seven, cases have been refused for lack of room. After further consultation with the Health Committee it has been arranged to keep fourteen beds for puerperal fever, three-fifths of the annual cost of which will be borne by the City Council. The additional beds proposed will bring the accommodation of the septic ward up to twenty-five. The operating room has already been erected, but the extension to the hospital necessitates an increase of ten beds in the nurses' home. The cost of carrying out the work and the necessary furnishing and equipment will be at least £6,000.

LONDON.

LONDON COUNTY COUNCIL.

Charges for Treatment of Minor Ailments.

THE London County Council decided last year[1] that a uniform charge of 1s. should be made to parents in respect of (1) the medical treatment of children suffering from ailments of the eye, ear, nose, and throat, and from ringworm; and (2) dental treatment, but that a charge of 1d. should be made in respect of children who had been ascertained by the Children's Care (School) Committees to be necessitous, and in approved cases where it had been ascertained by careful inquiry that the parents had been accustomed to subscribe to the Hospital Saturday Fund, or had any other legitimate claim to free hospital treatment. The Education Committee reported on October 15th as to the charges to be made for the treatment of minor ailments. In cases in which nursing treatment for minor ailments was supplemental or incidental to medical treatment, the committee thought that the present charge of 1s. or 1d. would suffice. In other cases, however, it would be necessary to make a charge for the services rendered; and, as a large proportion of the cases would be of quite a minor character, and the treatment required would be simple, and would take up a comparatively small amount of time, a uniform charge of 3d. would be suitable, subject to a reduction of 1d. in necessitous cases, and in cases where parents had been accustomed to subscribe to the Hospital Saturday Fund, or had any other legitimate claim to free hospital treatment.

The Council approved the suggested charge.

Annual Address of the Chairman.

In the course of the annual Chairman's address, Lord Cheylesmore referred at some length to the reorganization of the school medical work under the direction of the medical officer of health of the county, to the appointment of Dr. W. H. Hamer as medical officer, to the retention of Sir Shirley Murphy's services in consultative capacity, and to the agreements that have been entered into with hospitals and committees of local practitioners for the medical treatment of school children. He mentioned the important drainage works now in progress in the metropolis, and added that the Council had maintained its policy of securing, whenever possible, open spaces for the public. There were now 116 parks and open spaces, with a total area of 5,100 acres, in the administrative county. The provision of sanatoriums for the treatment of tuberculosis was under consideration, and much information as to existing means of treatment had been collected. The number of lunatics during 1911-12 had shown a larger increase than in the previous year, and the accommodation of the London asylums having been found insufficient, plans for an eleventh asylum had been prepared, and were awaiting the sanction of the Home Secretary. Progress had been made with the designing of a mental hospital, towards the cost of which Dr. Henry Maudsley had so generously contributed £30,000. The new legislation in regard to the mentally defective, if carried by Parliament, would throw additional responsibility upon the Council.

Street Ambulance Service.

Mr. H. L. Jephson asked the Chairman of the General Purposes Committee whether a return could be prepared showing the number of street accidents in London during the last three years. On receiving a promise that the matter would be brought before the committee, Mr. Jephson further asked whether it was a fact that the question of the provision of an ambulance service for London had been before the General Purposes Committee for five and a half years without any decision having been arrived at; that three and a half years had elapsed since a departmental committee reported, and that no action had been taken thereon by the Council. What explanation could be given of the delay on the part of the committee in deciding whether to take action or not, and could an assurance be given that a full report would be brought to the Council at once?

Mr. H. J. Greenwood, Chairman of the Committee, replied that the matter had been before the Council since 1901. In 1906 the Council unsuccessfully promoted legislation on the subject. The departmental committee issued its report in March, 1909, and in the same year the Council was empowered by Parliament to establish an ambulance service for London if it thought fit. The General Purposes Committee was making exhaustive inquiries (ironical applause), and when its negotiations were concluded it would report to the Council.

The Board of Education and Hospital Treatment.

In reply to a request by the London County Council that it would define more explicitly the basis of the allocation of the Government grant of £60,000 towards the medical inspection of children, the Board of Education, in a letter communicated to the Education Committee of the Council on October 16th, stated that nothing could be added at present to the reply given in the House of Commons by the Parliamentary Secretary to the Board on May 6th, 1912; that the amount of money at the Board's disposal was strictly limited, and that it would not be possible to state, even approximately, how the grant would be apportioned until statements of expenditure actually incurred during the year ended July 31st, 1912, had been considered.

It was reported to the Committee that the Vice-Chairman, acting under recess authority, had approved agreements with nursing institutions at Fulham, Islington, Peckham, St. Pancras, Norwood, and Wandsworth, for the employment of the equivalent of a full-time nurse in connexion with the treatment of school children suffering from minor ailments at the medical treatment centres already established in these districts. It was reported at the same meeting that these centres had received the approval of the Board of Education.

Scotland.

[FROM OUR SPECIAL CORRESPONDENTS.]

MEDICAL CONDITIONS IN THE HIGHLANDS.

THE committee appointed by the Treasury to investigate the medical, nursing, and hospital provision in the Highlands and islands, held a series of meetings in Sutherland last week. On October 7th a visit was paid to Bettyhill, in the extreme north of the county, to take evidence from witnesses as to the adequacy of medical and nursing attendance in the parishes of Tongue and Farr. In the latter parish, the second largest in Scotland, the problem of medical provision is extremely difficult, and in recent years has often been considered both by the parish council and the Board of Supervision. One witness drew attention

[1] BRITISH MEDICAL JOURNAL, July 29th, 1911, p. 244.

to the contrast between the medical and ecclesiastical provision, with the remark that whereas there was only one doctor in the parish there were usually eight clergymen. It was said that a large amount of suffering went unrelieved by medical treatment, and a large number of deaths not medically certified. The straitened circumstances of the bulk of the people frequently prevented them from calling a doctor even when available.

On October 8th the committee had a long sitting at Laing, when representative witnesses from several remote parts of the county gave evidence. The medical witnesses included Dr. Simpson (Golspie), Dr. Macrae (Bonar), Dr. Mowat (Laing), Dr. Johnstone (Brora), Dr. MacLennan (Lochinver), and Dr. Bremner (county medical officer of health). Mr. Mennie (Golspie) and Mr. Fraser (Helmsdale), chemists, gave evidence as to the supply of medicine, and more particularly of patent medicines of American manufacture, the sale of which was much larger than that of medicine supplied by the doctor's prescription.

On October 9th the committee travelled to Rhiconich, where evidence was taken from witnesses representing the parishes of Durness and Eddrachilis, and on October 10th the committee crossed by the fishery cruiser from Lochinchard to Stornoway.

On October 11th a meeting was held in the Town Hall, Stornoway, to take evidence as to the medical, sick nursing, and hospital provision in the Island of Lewis. The conditions as to public health and the health of school children were set forth by Dr. Murray, medical officer of health and school medical officer, and Dr. Mackenzie and Dr. Murchison gave evidence in regard to medical practice in the populous parish of Stornoway. The advisability of readjusting the present medical areas, the general inability of the people to pay adequate fees, the inadequacy of the nursing and hospital provision, and more especially the heavy burden of rates, were fully investigated.

Medical Treatment of School Children.

At the meeting of the Glasgow School Board on October 10th it was reported that the subject of medical treatment of school children had been considered by a committee, and that a grant of £1,500 had been allocated to the board for this purpose by the Education Department. The committee had outlined a scheme under which £850 would be devoted to dental clinics, £310 to skin clinics, £160 to eye clinics, and £100 to ear clinics. Dr. Grant Andrew, in moving the adoption of the recommendation, said the dental clinics would be established in Calton and at Elmbank Crescent. Cases of defective vision would be treated at the schools. The scheme was unanimously adopted.

Ireland.

[*FROM OUR SPECIAL CORRESPONDENTS.*]

The Treatment of Tuberculosis.

A deputation representing the Dublin Insurance Committee waited last week on the Local Government Board to draw attention to the allocation of funds for persons suffering from tuberculosis. It was urged that they should receive a weekly grant to cover the cost of treatment at their own homes, union hospitals not being fit places for the treatment of such patients, and the "pauper taint" being decidedly objectionable. After an exchange of views, an undertaking was arrived at that the Committee should formulate a definite scheme and submit it to the Board, which in turn undertook to consult with the Insurance Commissioners so as to establish the basis of a final settlement. Meantime, the Local Government Board will make no objection to the Sanatorium Committee continuing to administer the provisions of the Act on the lines which have been followed up to the present.

A deputation from the local Division attended a special meeting of the County Carlow Insurance Committee last week, and stated the terms under which the members were prepared to act. They accepted the offer of the Committee of 10s. 6d. for filling up Forms 2 and 4 pending the appointment of a tuberculosis medical officer. Other propositions as to fees for domiciliary attendance and travelling expenses were held over for information as to the available income from assurers. It was decided to recommend a salary to the medical officer of health to be appointed of £400 per annum, with £50 travelling expenses.

Last week a further statement appeared in the Irish daily press as the result of the interview with the Chairman of the Irish Insurance Commissioners. The chairman said:

> The first thing I wish to state with reference to the account of the interview published in the Irish press is that it was accurate in every particular. The interview was given after full consideration of my position as a civil servant and as chairman of the Commission, and I have had the sanction of my chiefs to the course I have taken. The object of the interview was not to endeavour to place the doctors in the wrong, but to let the country know exactly the position with reference to the sanatorium benefit. The point that seems to be lost sight of by the medical profession is that domiciliary treatment was not really part of the original plan connected with the above, and was inserted to meet the wishes of the profession, which complained that there was a danger of local medical practitioners having their private patients taken from them. We are most anxious that the doctors and the county committees should come to a sensible working arrangement, but it is our duty to see that the sanatorium benefit is not hung up indefinitely, and that the county councils are not discouraged from proceeding with their schemes by the cost which would be entailed should the demands of the doctors be acceded to.

Epidemic of Measles in New Ross.

The epidemic of measles in New Ross has now reached such proportions that at the last meeting of the Urban Council the Medical Superintendent recommended that the schools of the town should be closed for a fortnight. It was decided to communicate this recommendation to the school managers. A week ago it was reported that there were over 20 cases of measles and scarlatina in the local hospital, and since then the numbers have increased.

Royal Academy of Medicine in Ireland.

The annual general meeting of the Royal Academy of Medicine in Ireland was held last week in the Royal College of Physicians, and the following officers were elected for the coming year:

President: Walter G. Smith. General Secretary: J. Alfred Scott. Secretary for Foreign Correspondence: Sir John Moore.

Medical Section.—President: J. F. O'Carroll. Council: James Craig, H. O. Drury, J. A. Matson, Sir J. Moore, T. G. Moorhead, G. Peacocke, F. O. Purser, E. J. Watson, W. A. Winter.

Surgical Section.—President: R. D. Purefoy, F.R.C.S.

Obstetrical Section.—President: A. J. Horne.

Pathological Section.—President: A. H. White.

Section of Anatomy and Physiology.—President: B. J. Collingwood.

Section of State Medicine.—President: M. J. Nolan. Council: A. E. Boyd, W. M. Crofton, W. R. Dawson, T. P. C. Kirkpatrick, J. A. Matson, W. A. Winter.

Treatment of Tuberculosis in Belfast.

Some weeks ago the local Insurance Committee approached the Public Health Committee with regard to the treatment of tuberculous patients under the Act. The Committee also entered into communication with the Forster Green Hospital for Consumption and with the Royal Victoria Hospital and the Mater Infirmorum for the treatment of such cases of tuberculosis as were not suitable for sanatorium treatment. The Public Health Committee postponed consideration till April next; the civic provision for consumptives is pretty well met by the Whiteabbey Sanatorium under the Poor Law Board and the Forster Green Hospital, which the Corporation has enlarged and subsidized. The hospital boards have referred the matter to committees, so that complications may be avoided. Considerable regret is expressed that the local Insurance Committee has no general scheme or plan, and that no attempt has been made to consult the local Medical Committee. A multitude of problems have already been raised. It is asked who would have the power of admission or discharge of patients paid for under the Act. How would it affect the present subscribers? How would it affect the relations between doctors paid for domiciliary attendance and the medical staffs, who would either receive a small fee for such patients or, as at present, give their services free? All practitioners holding friendly society appointments have sent in their resignations, and a proposal has been made by the local Medical Committee that the question should be discussed at a general meeting of the visiting staffs of all the hospitals. The problems raised are endless: the solutions so far suggested are few and unsatisfactory.

Special Correspondence.

PARIS.

Angina Pectoris.—Notification of Tuberculosis.—Congress of Pediatrics.

AT a recent meeting of the Academy of Medicine Dr. Fliessinger discussed the various causes giving rise to symptoms of angina pectoris, and enumerated as the most important arteritis of the coronary arteries, aortic regurgitation, certain forms of myocarditis, high blood pressure in interstitial nephritis, and obesity and aërophagy. As to the prognosis in anginal symptoms due to the two latter causes, he was inclined to be optimistic, for with attention to diet and general hygiene the symptoms disappeared. In coronary arteritis mercurial treatment was the most satisfactory. In cases of aortic diseases small doses of the iodides gave relief, whereas in cases of chronic nephritis he advised theobromine combined with a laxative. In myocarditis small doses of digitalin appeared to give the most favourable results. The complication of aërophagy, or swallowing of air, was frequently troublesome in all forms of angina, and in one case cited by Dr. Robin death resulted from the gaseous distension of the stomach acting upon the already embarrassed heart. For the aërophagy which so frequently occurs in hyperchlorhydria, nervous and flatulent dyspepsia, Dr. Fliessinger had no suggestion beyond the exhibition of alkalis, especially sodium bicarbonate.

A discussion on the compulsory notification of phthisis has been opened at the Academy of Medicine by Dr. Letulle, who presented the following conclusions:

1. Tuberculosis is a contagious disease disseminated by the tubercle bacilli in the spit of phthisical patients.
2. Alcoholism must be stamped out, and the general hygienic life of the working classes ameliorated.
3. Tuberculosis should be a notifiable disease.
4. Notification must be made by the parents of phthisical children when the disease is known to exist, or, in default of such person, it must be notified by the doctor in attendance.
5. The notification must be accompanied by a medical certificate.
6. The State should take in hand the disinfection of the tuberculous patient's house, and give necessary care and treatment to phthisical patients.

During a discussion on infantile anaemia at the International Congress of Pediatrics, Dr. Tixier spoke of the difficulty in classification of the bone-marrow reaction and also of the changes produced in the spleen. Professor Jumna read an interesting paper on anaemia Leishmania in infancy. The parasite, which is distributed by the house-flea, might be found in the bone marrow and liver. The disease might be either acute, subacute, or chronic. The treatment so far adopted had produced little effect on the disease, and the prognosis was not good. Dr. Czerny of Strassburg, in discussing anaemia due to alimentary toxaemia, observed that it was often complicated by rickets, and that enlargement of the liver, spleen, and lymphatic glands was frequently present. In some, if not all, cases the milk was at fault, and in many the condition was due to the fact that the child had been fed on milk and milk alone for too prolonged a period.

THE Lord Chancellor, on the recommendation of Colonel Mount Batten, C.B., Lord Lieutenant for Dorset, has placed Mr. W. Burrough Cosens, honorary surgeon to the Dorset County Hospital, on the Commission of the Peace for the county.

THE St. Joseph's Hospital for Incurables, Chiswick, has been under the care of the East Grinstead Sisters since May, 1910. It was originated by the Sisters of St. John's House some forty years ago, but was moved to the new buildings at Chiswick in 1899. Since the institution has been in the hands of the East Grinstead Sisters a home for paying patients, under the charge of a trained nurse as matron, has been added to the adjoining convent. The home is intended for incurable cases among women and girls, especially from paralysis and rheumatoid arthritis. The home was opened on Tuesday, October 8th, by Sir Anthony Bowlby, who was accompanied by Lady Bowlby and Lady Duckworth, and by a number of members of the medical profession.

Correspondence.

THE ORGANIZATION OF THE CAMPAIGN AGAINST TUBERCULOSIS.

SIR,—I regret that I was in Scotland when Dr. Lauriston Shaw's letter on the organization of the campaign against tuberculosis appeared in your issue of September 28th.

Both in his letter, and in the "model scheme" for the treatment of tuberculosis drawn up by the State Sickness Insurance Committee, an attack is made upon the system of tuberculin dispensaries. I do not think Dr. Shaw is in a position to analyse, much less condemn, the functions of a tuberculin dispensary from any first-hand knowledge, and the Committee in deciding that "all attempts to make tuberculosis dispensaries into institutions merely for the administration of tuberculin should be rigidly discouraged," might have investigated the work of these dispensaries before it attempted to smother them. I know of no institution existing "merely for the administration of tuberculin," though, with some practical knowledge of tuberculin dispensaries, I do not hesitate to say that the proper administration of tuberculin at these institutions, which I have called into existence, provides simpler, cheaper, and more effective treatment for dealing with tuberculosis among the poor than any system hitherto proposed, and I think I can prove by evidence, which neither Dr. Shaw nor the Committee could rebut, before a properly constituted tribunal, that the more stereotyped an institution becomes in the proper use of tuberculin in the diagnosis and treatment of tuberculosis, the better both for the patients and the medical profession, especially the general practitioners. One of my reasons for urging, in season and out of season, the appointment of such a tribunal to sift and weigh evidence for and against tuberculin treatment, has been to silence medical men like Dr. Shaw, who are ready to form an opinion upon the value of tuberculin treatment without having had any experience to justify a judgement.

Dr. Shaw makes the following remarkable statement, which would need much qualification and attenuation before a judicial tribunal:

> Most of us who are over middle age can remember large numbers of so-called specific methods of treating tuberculosis which at the height of their popularity were asserted to be the only infallible methods of cure.

As one with this necessary age qualification, I cannot remember anywhere in medical literature—and I trust Dr. Shaw is not referring to quack advertisements—any specific methods of treating tuberculosis which were ever asserted to be "the only infallible methods of cure." The only specific method of treating tuberculosis is associated with Professor Koch's epoch-making discovery of tuberculin, but, as one fairly familiar with most of the literature upon tuberculin, I venture to assert that neither Professor Koch nor any of his pupils have ever spoken or written in a way to justify this extravagant and inaccurate language. I have asserted, and am ready to support my claim before any competent judge, that tuberculin dispensaries are the best institutions for dealing with the treatment of tuberculosis among the poorer classes.

With a strange disregard of the practical side of this problem, Dr. Shaw and those whom he follows always studiously avoid any reference to finance. If there is any amount of money waiting to be spent upon this huge national problem, there are a multitude of ways of enlarging the scope of our activities at tuberculin dispensaries; but if there is a limited amount of money at our disposal, it is best to deal with the problem so as to secure the greatest good to the greatest number. I doubt not that Dr. Shaw has still an unshaken belief in the value of sanatorium treatment, yet I think I can prove before any board of inquiry that for a given amount of money tuberculin dispensaries can deal with 70 per cent. of the cases of tuberculosis and secure 70 per cent. of successes, while for the same amount sanatorium methods can hardly deal satisfactorily with 10 per cent. of the cases, and can at most secure 50 per cent. of successes. After all, the Insurance Act, the funds for which are exacted from employers and employees, is framed and designed to

treat insured persons afflicted with tuberculosis, so as to restore the sick to health. It is not the purpose of the Insurance Act to encroach upon the province of preventive medicine, which should be left in the hands of the medical officer of health. When the money provided is more than sufficient to supply treatment to the sufferers, it will be time enough to consider how the balance shall be spent upon measures of prevention.

Too little attention has been paid to the urgent needs of the unfortunate victims of tuberculosis in the "model scheme," and the Regulations of the Insurance Commissioners are being twisted so as seriously to interfere with the free choice both of the sufferer and of his medical adviser. I will give two instances: An insured person came to the tuberculin dispensary for treatment. He applied to the Insurance Committee of the London County Council for assistance. The Insurance Committee told the applicant that they would provide sanatorium treatment for him. He replied that he had already had five months' sanatorium treatment at Benenden, and at the end of it was rather worse than better. Thereupon he was allowed to return to the tuberculin dispensary. In another instance an insured person, wishing to have tuberculin treatment through his own doctor, applied to the Insurance Committee. This person was sent on by the Insurance Committee to another medical man, Dr. Squire, I presume at a fee of not less than one guinea. Here the Insurance Committee interfered both with the patient's choice of doctor and the doctor's choice of treatment. Before the insured person could get any benefit a preliminary outlay of at least 25s. was necessary. General practitioners, accordingly, can hardly expect fair treatment from the Insurance Committee of the London County Council. Dr. Shaw says: "It is earnestly to be hoped that every doctor engaged in the fight against tuberculosis will be allowed free choice of treatment." In these instances not much free choice was allowed either to the insured person or to his doctor. This Insurance Committee apparently exhibits the same bias as Dr. Lauriston Shaw.

Through my work in London at least forty tuberculin dispensaries have been established in different parts of the country, and the work of these dispensaries should be judged on its own merits, and not prejudged by medical men who have had no opportunity of studying the nature and scope of these institutions. It is little short of cruel that insured persons should be debarred from seeking a form of treatment at properly organized institutions, such as tuberculin dispensaries, when they have very definite knowledge of the benefit to be obtained by the proper use of tuberculin.

There is no coercion at tuberculin dispensaries, and treatment is often tedious and troublesome, yet we are overwhelmed with applications. In the presence of this evidence in favour of the value of tuberculin treatment, is it fair, either to the patients or to the doctors who believe thoroughly in the system, that an embargo should be placed upon these institutions without any investigation of the merits of the system? I believe that a proper investigation of the work at tuberculin dispensaries would show that they should be placed in the forefront of any scheme for the treatment of tuberculosis among insured persons.

The general practitioner is the one who should advise his patient to the best of his ability, and there are hundreds of general practitioners at the present time who would select the tuberculin dispensaries for the treatment of their own cases, and as the general practitioner slowly and laboriously learns for himself the proper use of tuberculin, he should have the privilege of treating his patients. At the present time, through my work, the medical men of Finsbury and also of Islington have themselves established tuberculin dispensaries with this definite object in view. It would be preposterous that any decision or regulation of the State Sickness Insurance Committee should interfere with this progressive and independent line of action with regard to the dispensing of sanatorium benefit under the Insurance Act.

This matter has no personal interest for me, because I do not intend to make a single penny through tuberculin dispensaries, but I intend, so far as lies in my power, to teach the general practitioner how he may best serve insured people who suffer from tuberculosis through the administration of tuberculin. We do much else at tuberculin dispensaries besides using tuberculin, but at the same time we make it the essential remedy for tuberculosis in all its forms.—I am, etc.,

W. CAMAC WILKINSON, M.D.Lond., F.R.C.P.,
Late Lecturer in Medicine, Sydney University.

London, N.W., Oct. 12th.

TUBERCULIN TREATMENT.

SIR,—We should like to offer a few general observations on the undesirable results which may follow the production of a high degree of tolerance to tuberculin in the case of patients receiving tuberculin treatment.

In vaccine therapy it is accepted as a cardinal principle that the more acute and extensive the infection the smaller should be the initial dose, and that the increase in dosage should be carried out with great care and with due regard to the focal, as well as the systemic, effect. In any external disease which is visible to the eye the degree of focal reaction can be readily observed, but in the case of pulmonary tuberculosis the focal effect is liable to be overlooked unless careful search be made. For practical purposes tuberculin may be considered to be a vaccine, although the nearest approach to a true vaccine is probably B.E. We venture to suggest that the same principles which apply to other departments of vaccine therapy should govern the administration of tuberculin.

The aim of tuberculin treatment is to secure a direct immunizing response at the seat of disease with a parallel degree of tolerance both to the auto-tuberculin produced and to the tuberculin injected. We believe that this can only be secured by an initial dose, sufficiently small to evoke a focal response without any constitutional disturbance, and by gradually increasing the dosage at intervals of not less than one week. If tuberculin be administered at shorter intervals the immunizing response is interfered with, owing to the setting up of two negative phases, and we have observed that in cases in which the dose has been too frequently administered and too rapidly increased a condition of tolerance to tuberculin is produced without any commensurate immunizing response at the seat of disease. Indeed, this condition of tolerance to tuberculin may have the effect of masking the progression of a smouldering lesion in the lung, the physician being thrown off his guard by the apparent feeling of well-being enjoyed by the patient. Thus, while evidence of constitutional disturbance may be entirely absent, examination of the patient will reveal the presence of coarse crepitations and the evidence of invasion of fresh areas of pulmonary tissue. Several such cases have come under the writers' observation, and they serve to emphasize the necessity of a frequent examination of the chest during the whole course of tuberculin treatment. In treatment by induced auto-inoculation, on the other hand, the examination of the chest is less frequently called for, as the constitutional condition provides a more trustworthy guide to the extent of the focal reaction. Here the patient benefits first of all by the immunizing response evoked and, secondly, by the degree of tolerance which he gradually acquires to his own tuberculin. It would seem to be unnecessary and undesirable to produce a tolerance to an amount of tuberculin far in excess of that which can possibly be produced by the lesion.

If the chief aim of tuberculin treatment be to secure a high degree of tolerance to tuberculin, then the result will be to increase the number of bacilli carriers by masking the constitutional evidence of the disease without healing the infective focus.—I am, etc.,

H. HYSLOP THOMSON.
E. H. R. HARRIES.

Newport, Mon., Oct. 9th.

SIR,—In your issue of October 12th, p. 959, is a paper read before the British Medical Association by Dr. L. D. Parsons, of Gibraltar. The whole of the paper is much what we have learnt to expect from disciples of Dr. Camac Wilkinson.

Dr. Parsons does not seem to be aware that the work of von Pirquet and of other observers on the tuberculin tests and on *post-mortem* material shows that from 50 per cent. to 80 per cent. (the percentage varying according to the locality) of clinically healthy adults have at some time or other had a tuberculous infection, and consequently give a tuberculin reaction. Dr. Parsons apparently has been using the subcutaneous method, the most delicate of all,

and from the context one gathers that the criterion of a positive result has been taken to be a rise of temperature only.

But to say, as he does, that any one who gives this reaction needs treatment quite apart from any symptoms of disease, is going very much farther than the facts warrant—indeed, is entirely opposed to the facts.

The classical experiments of Franz may be quoted, who tested by the subcutaneous method the soldiers of two regiments, and found that 50 per cent. of them reacted. Does Dr. Parsons seriously maintain that all these men needed treatment? And if, as he suggests, the method were applied to all recruits, I fancy that conscription would be necessary to maintain our army at even half its present strength.

If Dr. Parsons will devote some short time to the study of current medical literature I think he will soon arrive at a more reasonable state of mind. Finally, may I ask his object in giving test doses of tuberculin to cases he has already diagnosed by the physical signs, if he merely observes the ensuing rise of temperature? I can understand, without defending, a physician who searches the chest during such a reaction for increased physical signs in order to ascertain the real extent of the disease, but to use the test merely to provoke a rise of temperature which will follow as a matter of course in a tuberculous patient, unless he has a high degree of immunity, seems, to say the least, unnecessary.—I am, etc.,

Sanatorium, Birmingham, Oct. 13th. H. Coppock, M.D.

MODEL SCHEME FOR THE TREATMENT OF TUBERCULOSIS.

Sir,—There must be many members of the Association who will share with me a feeling of disappointment, if not of dismay, on reading the model scheme and the editorial on this subject in the Journal of October 5th.

A careful perusal of the document shows that the fundamental principles are the welfare of the private doctor and the restriction of the duties of the tuberculosis officer and dispensary doctor so that they may not encroach on the preserves of the general practitioner. In my opinion we should have taken a wiser and more dignified course as a profession in refusing to work sanatorium benefits till the Government were prepared to make it a comprehensive plan aiming at stamping out tuberculosis altogether, rather than attempt to make capital out of a scheme which, to use your own words, is designed for the cure and not the prevention of tuberculosis.

We in Oxford have now two years' experience in organizing a crusade against the disease, attempting not only to cure those afflicted, but to prevent the spread of infection. Our work is confined to the necessitous poor, and our armament for the fight consists briefly of the following:

The Scheme of the Association for the Prevention of Tuberculosis in Vogue in Oxford.

1. A tuberculosis officer, whose efforts at treatment are confined to the dispensaries, and whose main function is to act as health officer for tuberculosis. He visits the homes, places of work, and schools of those affected, examines contacts and other suspects, placing them under continuous observation. He arranges for the provision of shelters and, perhaps, of food when necessary; and he administers tuberculin to selected cases at the dispensary.
2. Nurses, who assist at the dispensary and visit dispensary cases at their own homes.
3. Dispensaries, of which the main one is at the Radcliffe Infirmary and three smaller ones in the outlying districts. Locally the staff of the hospital and tuberculosis officer treat the cases, whilst in the country dispensaries the local practitioners assist the tuberculosis officer.
4. Finally, when patients are too ill to attend the dispensaries, arrangements are made with private doctors to attend them at their own homes.

Advantages over the Model Scheme.

1. We get hold of a large number of strumous delicate children and contact cases, who undoubtedly are infected, though the disease is not yet in an active stage.
2. With our nurses, warm rooms, dark room, weighing machines, etc., we can and do give a much more thorough examination than the private doctor is usually able to.
3. We gain much greater experience in the administration of tuberculin, both as to the class of patient and kind of tuberculin advisable, than is possible for the average private doctor to have.
4. With our surprise visits by the officer and nurses and our shelters, etc., we believe that we do much to prevent the spread of the disease.
5. As only the tuberculosis officer and nurses are paid, this work is done at a very moderate cost to the community, and is largely met by private charity.

The Shortcomings of the Model Scheme.

1. Consumptives only too often postpone consulting a doctor, and those who may only attend a dispensary with a doctor's order will often come too late to hope for recovery. We want to seek our cases amongst those exposed to infection.
2. No provision is made for supplying nurses' thermometers, expectoration flasks, or weighing machines, etc.
3. Domiciliary treatment in the absence of any of the machinery mentioned in paragraph 2 will prove unsatisfactory. And yet can the authors of the model scheme really intend patients to attend regularly at the surgeries of their private doctors? Such a procedure is certainly more consistent with the cure than the provention of tuberculosis.
4. The administration of tuberculin would be in more competent and experienced hands as a rule at the dispensary.
5. There is no suggestion for preventing the disease, and no provision is made for examining contacts.
6. As it is in no way compulsory for the local authority to take care of the uninsured consumptive, is it likely that a body whose main object is to keep down the rates will find the enormous sum required to finance the model scheme?

As a general practitioner I, like my colleagues, naturally welcome any proposals which will assist me to meet the ever-growing demands on my purse. But it is to be feared that, even if the necessary funds are forthcoming, the adoption of the model scheme here instead of the work of the Association for the Prevention of Tuberculosis will be disastrous to the interests of the public, and therefore foredoomed to failure.—I am, etc.,

Oxford, Oct. 9th. Ernest Mallam.

THE TREATMENT OF NEURASTHENIA.

Sir,—In a letter under this heading (October 12th) Dr. John Haddon states that he can produce neurasthenia by dieting, and he can cure it in three days by dieting and exercise. Although in the past the cure of neurasthenia has been reached by many different routes, none of them has been capable of pointing us at all surely to its cause. But he who can summon its manifestations at will may claim to have touched the root of the matter and to have resolved one of the most perplexing problems of medicine. Dr. Haddon pleads for a commission to inquire into the dietetic treatment of disease. But one may hope that he will not wait for such a consummation before he consents to share with the rest of us an item of knowledge so vital to the numerous victims of the distressing malady in question. I should be sorry to ask a laborious exposition from him, but beg your leave to appeal to him for:

1. An example of the dietary which may be relied upon to produce neurasthenia.
2. An example of the dietary which will cure it so quickly.
3. The special features, if any, of the exercises to be employed in the cure.—I am, etc.,

London, W., Oct. 12th. William P. S. Branson.

Sir,—Since my letter in defence of British *versus* German medicine which appeared on Saturday, I have received so many letters from my medical brethren asking my advice, that I hope you will find room for this letter in your next issue because I cannot undertake to answer them.

Much as I sympathize with medical men who suffer from that dreadful malady, it is, I find, absolutely necessary to have the patients under my own personal supervision, for the will power of the patient is gone, and a stronger must be substituted so as to ensure obedience. It is an asylum we require for such cases, for, as in insanity, it is the mental centres that are at fault; and if medical superintendents of asylums (many of whom I have for some years endeavoured to convert to the proper treatment of their patients) had followed the right line, they might have emptied their asylums. If, however, the publicity of my success in curing myself and others should lead to the abandonment of the mere symptomatic treatment of disease by drugs and a return to the study of ancient medicine by the modern physician, I shall feel that the misery I have suffered from reliance on such treatment has not been in vain.—I am, etc.,

Hawick, Oct. 14th. John Haddon, M.D.

A STATE MEDICAL SERVICE.

Sir,—In your issue of September 28th (p. 799) you refer to my State Medical Service scheme as a "full-blown socialistic régime," and I admit that at first sight it seems quite unnecessary for our profession to interest itself in what I cannot deny is a socialistic scheme. But—and this is a big but—is not the work of our profession drifting gradually into a scheme of this sort? and inspectors of schools, tuberculosis inspectors, medical officers of health, etc., are cutting into the life-work of medical men. We are not to in future call in the Harley Street specialist in a case of tuberculosis and pay him two guineas, but we must call in the county inspector, who is paid out of the rates, and so we drift on. What I want the profession to do is to take the bull by the horns and say to the Government, "You are taking our work away in pieces; we are as a whole absolutely unconsidered; what we demand is that we shall have a Minister of Public Health and a Board of Public Health, and we will come under that board and no other; we will not be the slaves of insurance companies and county councils; we wish to have our goings and comings and our doings absolutely controlled by members of our own profession, and not by a class of men who know nothing of our work, services, disappointments, etc. As things go, it will be absurd of any of us to put our sons into the medical profession—it is getting into such a tangle and muddle with one kind of appointment and another, and no uniformity of salary; but if such a scheme as mine came in, with the Board of Health in control of the salaries and appointments, underselling and underpaying by councils would be done away with. I should not dream of putting my sons in anything else.

Another point you mention is the doubt as to whether all the present members would get employment. As work would be more evenly divided, and as a very large staff of locumtenents would be required under my scheme (for every member would have one month off per annum), I doubt whether we should have enough men. Many now take no holidays, except, perhaps, week-ends, but a medical man ought to have a complete rest in the interests of his patients; and, again, under my scheme every five years the member of the State Medical Service has three or six months' leave to attend hospitals. We who live near London or other large towns can attend lectures, but, buried in the country, many men are years behind the times. I know one man who, ten years after sodium salicylate had been in use for rheumatism, had never heard of it, and the other day I met a man, in town, who had no experience of aspirin. These are the highly intelligent people who tell the public that drugs are no use. We cannot expect a man to be up in all the details of antitoxin treatment and electrical treatment, but we do expect him to know a little about drugs. The only absolute objection so far made to my scheme is that it is "too much in favour of the doctors." This, of course, was said by a member of another profession.—I am, etc.,

Leytonstone, Oct. 7th. Arthur Todd-White.

FORCIBLE FEEDING.

Sir,—In reading the letters that have appeared on this subject I have been puzzled by the almost complete absence of any comment on the methods that have been adopted for carrying it out. From letters in *Votes for Women*, and from personal inquiry, I am led to believe that the routine methods were the nasal tube and cup-feeding, and that in many cases there was violent struggling, prolonged over a period of half or three-quarters of an hour, which resulted in the women being left in a state of extreme exhaustion. The statements about the prolonged struggling may be exaggerated, but it is certain that large numbers of prisoners were liberated long before the expiration of their sentences, and were sent home in a very dangerous state, which could hardly have been produced by starvation alone in the time. I am anxious to know why the nasal tube was adopted, because it has always seemed to me to be much more painful and dangerous than the larger and stiffer tube of the ordinary stomach pump, which is introduced through the mouth. There are statements of the nasal tube curling forward and coming out of the mouth and being pushed back by the doctor's fingers. It may also enter the larynx, and is said to have done so.

Many years ago I did a good deal of tube feeding in the Durham County Asylum, and later, in private practice and in the Gateshead Workhouse Infirmary, I have adopted the same method. It is my opinion that with not less than five assistants, a screw apparatus for opening the mouth, and a fairly large and rather stiff tube, any patient can be fed with very little difficulty and hardly any danger. The patient lies face upwards on a bed—on a mattress, not an air or water bed—and is held so that struggling is impossible; therefore there is no exhaustion and no encouragement to struggle on subsequent occasions. This absolute control is impossible with a patient in a chair.

I shall also be glad to know more about the two men who are said to have died under forcible feeding.

In writing thus I am stating my opinion, but it seems that other people have thought differently, and I ask for an explanation. The suffragettes have inflicted a disastrous injury on the administration of justice in the British Empire.—I am, etc.,

Ipswich, Oct. 14th. A. Woolsey Blacklock, M.D.

THE RULE OF THE ROAD.

Sir,—It may interest your readers to know that this rule originated, in this country, in the narrowness of old London Bridge, and the abundance of traffic thereon.

In 1722, the Lord Mayor, Aldermen, and Common Council, being sensible of the great inconveniences and mischiefs which happened by the disorderly driving of coaches, carts, and other carriages on the bridge, promulgated an order that all carriages coming out of Southwark into the city should keep along the west side of the bridge, and those going out of the city on the east side, appointing three persons at each end to see this order executed; and this method, says a writer forty years later, is still observed. It is clear, therefore, that at the time the order was made, and most likely that forty years later, there was no rule of the road, except on the bridge itself. It was natural that as traffic became more frequent in the streets of London, the rule should be extended to them, and so to the rest of the country, being spread by the drivers of vehicles from London. No reason is given for the selection of the left for the near side, and it seems clear, from the directions as to east and west, that the rule did not take its rise from any greater convenience to drivers to keep to the left. From London Bridge this rule has spread over the whole of the United Kingdom, and all the oversea colonies and dependencies thereof, and to the United States of America.—I am, etc.,

Parkstone, Dorset, Oct. 12th. Charles Mercier.

The Services.

HEALTH OF THE EUROPEAN TROOPS IN INDIA, 1911.

The annual report issued by the Director-General of Medical Services in India shows that the remarkable improvement in sickness and mortality recorded in 1910 was maintained and in some respects increased in 1911. The chief features are shown in the following table:

All Causes.	Ratio per 1,000 of Strength.		
	1905-09.	1910.	1911.
Admissions	802.5	576.5	524.7
Constantly sick	47.26	31.93	28.81
Deaths in the command	8.79	4.66	4.89
Invalids sent home	19.92	7.75	7.07
Invalids finally discharged	8.99	6.51	—
Average sick time to each soldier... ...	17.25	11.66	10.52
Average duration of each case of sickness	21.50	20.22	20.05

The slight increase in the ratio of deaths from all causes is attributed to a large number of casualties from heat-

stroke, and an increased number of deaths from both cholera and plague.

Heat-Stroke.

The hot weather was unusually severe owing to the irregularity and amount of distribution of the monsoon; the conditions rendered the life of the soldier in the plains of India exceptionally trying.

Plague.

Nine cases of plague with 6 deaths occurred; all the cases were single with the exception of 3 among the band of the Royal Scots at Allahabad; they went to Benares to play, and travelled in compartments out of which large numbers of the Indians had issued at Allahabad. Cases of plague developed among the bandsmen a few days later, and the inference drawn was that they had contracted the disease in the railway carriage.

Cholera.

There were 38 admissions and 21 deaths; both were in excess of recent experience. The disease was prevalent among the native population, and one series of 4 cases with 4 deaths was directly traced to the consuming of bazaar supplies; another series of 7 cases with 4 deaths in a regiment on the march appears to have been contracted in villages traversed en route; a third series of 26 cases with 12 deaths was traced to infected butter sold from the regimental dairy; the dairy had run short, and had purchased butter in a bazaar from a maker in whose house cholera cases and deaths had occurred.

Typhoid and Paratyphoid Fever.

Enterica.—For the purpose of comparison with previous years, cases of typhoid and paratyphoid fever are in one part of the report brought together. It appears that ten years ago the admission-rate per 1,000 was 12.8, and the death-rate 3.32; in 1911 the rates were respectively 3.8 and 0.33.

Typhoid Fever.—Under the headings "enteric fever" and "paratyphoid fever," the particulars of the cases lumped together under "enterica" are given. The number of cases of typhoid fever in 1911 was the lowest on record. There were only 170 cases altogether, with 22 deaths, equivalent to an admission-rate of 2.3 per 1,000 of strength, and death-rate of 0.3. There was no epidemic outbreak. The cases were more or less isolated, and scattered over a large number of units and places. Nursing orderlies and others engaged in attendance upon the sick were remarkably free, and there was no evidence that milk, water, or articles of food had caused the disease.

Paratyphoid Fever.—Paratyphoid fever was first carefully distinguished in the returns from typhoid fever in 1910. The diagnosis was in all cases made by the isolation of the specific bacillus, which in 103 of the 104 cases was of the (A) variety. In the one remaining case it was of the (B) variety. The case mortality of typhoid fever was 12.9, of paratyphoid fever 2.0 per cent., and the latter disease showed a tendency to occur in explosive outbreaks. The four chief of these were carefully investigated by Major Grattan, Major Faichnie, Major Walton, and Captain Safford, of the Royal Army Medical Corps, and in all instances the determining factor was found not to be water, milk, or any other article of food, but the presence of an undetected and unsuspected infected person.

Enteric Fever—Dépôts.—The enteric fever dépôts at Naini Tal and Wellington proved very useful. To them are sent convalescents not only from typhoid and paratyphoid fever, but also from types of pyrexia of uncertain origin, which, though not diagnosed as either disease, yet afford evidence that they may have been one or the other. Of 138 cases of this kind seen at Naini Tal, 5 were found to be excreting the paratyphoid (A) bacillus in the faeces. Among the 95 cases convalescing from typhoid fever sent to Naini Tal, no carrier was discovered, while in 85 cases convalescent from paratyphoid fever, twelve carriers were detected.

Antityphoid Inoculation.—Of the European troops serving in India 85 per cent. have been inoculated. Upon this subject the report contains the following paragraphs:

> The influence of inoculation against paratyphoid infection appears to be negative. Of the 104 cases of paratyphoid fever, no less than 97 were inoculated men with 2 deaths, while the other seven cases were not inoculated men. The admission rate per 1,000 among the inoculated is 1.57, and 0.73 among the not inoculated. The coefficient of correlation between inoculation and freedom from attack by paratyphoid fever is 0.1994 ± 0.0073.
>
> If we take the two diseases, enteric fever and paratyphoid fever together, we find that the admission rate among the inoculated is 2.75 per 1,000, while among the not inoculated it is 10.88. The corresponding death-rates per 1,000 are 0.17 and 1.15; further, the coefficient of correlation between inoculation and freedom from attack is 0.2527, 0.0071, while the coefficient between inoculation and recovery after attack is 0.6579, 0.0684. The above figures indicate that against true enteric fever the value of inoculation is most marked, and the case in favour of the procedure much strengthened by our experiences during 1911. The disturbing factor is the prevalence of paratyphoid fever, against which disease antienteric inoculation appears to have little influence. This view was hinted at in last year's report, and emphasizes the plea for a polyvalent, or rather a bivalent, emulsion with which inoculation could be carried out against both diseases. The reinoculation of men after a lapse of thirty months since their primary inoculation is being steadily pressed, and meets with an encouraging support from all ranks.

Malaria.

There were 3,045 fever admissions in 1911. It was not thought that this diminution could be attributed to any special action on the part of either the State or the medical services, but that it was probably associated with the comparatively small and irregular rainfall of the year. Further information, it is stated, is required with regard to the degree of infectiveness of the human population and of the extent to which the mosquitos are infected, and also as to the seasonal variation of infectivity among mosquitos. Attention is called to the fact that an apyrexial malarial carrier may be a danger to a unit or other community if the *Anopheles* mosquito be present. The remedy recommended is the routine use of netting at night. The active antimalarial measures carried out in all garrisons by mosquito brigades have not diminished, and the work is slowly bearing fruit; the systematic administration of quinine has been extended and a more complete record of all cases of malaria instituted. On the other hand, the number of cases of sand-fly fever showed a remarkable increase—from 512 in 1910 to 1,393 in 1911. This is believed to be due to increased accuracy of diagnosis, such cases having previously been confused with malaria.

Chloroform.

It is stated that 3 deaths followed chloroform inhalation; in no case was blame or want of care to be attributed to the anaesthetist, but the number seems rather large, having regard to what has been said as to the relative safety of the administration of chloroform in India.

Venereal Diseases.

These diseases caused 3,842 admissions during the year, a definite decrease as compared with former years. In respect of the component groups decrease, as compared with 1910, was 2.6 per cent. of admissions for syphilis per 1,000 of strength, 1.4 per cent. for soft chancre, and 1.8 per cent. for gonorrhoea. This is equivalent to a total decrease of 5.8 per 1,000 of strength in admissions to hospital for all forms of venereal disease. There was a decrease of 51.31 per 1,000 in the average number of constantly sick from all forms of venereal disease.

The gradual fall in the admission rate for all forms of venereal disease during recent years is summarized in the following table, the ratios being in all cases per 1,000 of strength:

Years.	Syphilis.	Gonorrhoea.	Soft Chancre.	All forms of Venereal Disease.
1907	22.2	48.0	19.7	89.9
1908	15.8	37.9	16.1	69.8
1909	16.3	37.7	13.9	67.8
1910	14.5	33.5	10.9	58.9
1911	11.9	31.7	9.5	53.1

The invaliding rate has also fallen, and this favourable result is attributed to improved methods of treatment, more especially by salvarsan with after-treatment by mercury and iodides. Salvarsan was used altogether in 432 cases; in 225 in which it was administered intramuscularly there were 37 failures; in 207 cases treated intravenously there were only 5 failures. Its action on ulcerative and early lesions is reported to be most definite and good. The employment of the Wassermann reaction is a routine procedure in all the military hospitals in India.

Officers.

The number of admissions declined from 532 in 1910 to 450 in 1911, but the ratios of admissions of invaliding and of deaths in the command are now higher among officers than among the men. The deaths in the command gives

a ratio per 1,000 strength of 8.10 for officers, as compared with 4.89 for non-commissioned officers and men. This discrepancy is attributable, in part, to the heavier incidence of enterica among the officers, the outcome of exposure to risks in jungles and out-of-the-way places when on leave or shooting expeditions, but in part to the comparatively small percentage of officers inoculated against typhoid fever. The percentage of inoculated persons among the men is 85, while among the officers it is only 51.

Women and Children.

The general health of women was good as compared with former years, though the death-rate was slightly higher, but the health of the children in barracks was not good. The admission-rate from all causes rose from 343.5 to 370.6, and the death-rate was also somewhat higher.

INDIAN MEDICAL SERVICE.

It has been decided that officers without a permanent regimental appointment who are officiating in the Bacteriological Department shall draw staff pay at the rate of 225 rupees per mensem if under, and 250 rupees per mensem if over, five years' service.

Officers of this department are eligible for the benefits of Presidency house allowance in Madras and of the Calcutta and Bombay house allowance schemes.

Universities and Colleges.

UNIVERSITY OF CAMBRIDGE.

The following candidates have been approved at the examination indicated:

First M.B.—*Part I. Chemistry:* F. Allen, D. J. Batterham, P. J. Briggs, E. B. Brown, G. W. Brown, T. A. Butcher, T. A. Collot, R. S. Corbett, G. P. Crampton, T. L. Crawhall, L. P. L. Edwards, G. G. Havers, J. M. Higgington, J. B. S. Lewis, G. T. Lipshytz, R. H. Marten, R. T. Raine, D. W. R. Richardson, G. D. C. Tracy, C. R. H. Weekes, T. A. V. Wood. *Part II. Physics:* F. Allen, D. J. Batterham, D. C. Beaumont, P. J. Briggs, E. B. Brown, G. W. Brown, T. A. Butcher, B. M. Coates, G. P. Crampton, T. L. Crawhall, L. P. L. Edwards, R. T. S. Gwynne, E. W. Hall, G. G. Havers, J. M. Higgington, M. H. Jupe, G. T. Lipshytz, H. H. Marten, G. S. Need, R. T. Raine, D. W. R. Richardson, G. D. C. Tracy, C. R. H. Weekes, T. A. V. Wood. *Part III. Elementary Biology:* F. Allen, D. C. Beaumont, G. H. Bickley, T. A. Butcher, B. M. Coates, G. P. Crampton, W. L. Dandridge, L. P. L. Edwards, E. W. Hall, M. H. Jupe, R. T. Raine, D. W. R. Richardson, C. R. H. Weekes, T. A. V. Wood.

UNIVERSITY OF LONDON.

The London Hospital.

The competition for entrance scholarships at the Medical School of the London Hospital resulted as follows: The *Price Scholarship in Science*, value £100, was awarded to Mr. R. G. Simpson; the *Price Scholarship in Anatomy*, value 50 guineas, was divided between Messrs. W. D. Newcomb, of Trinity College, Cambridge, and A. C. Ainsley, of Caius College, Cambridge. Similarly treated was the *Buxton Scholarship in Arts*, the dividers being Mr. H. L. Douglas and Mr. S. E. Harvey; while the *Entrance Scholarship in Arts*, value £50, went to Mr. V. J. F. Lack. To the *Epsom Scholarship*, value £120, Mr. S. H. de G. Pritchard was appointed on the nomination of the Head Master of Epsom College.

SCOTTISH UNIVERSITIES.

Inclusive Fees.

At a conference of representatives of the General Councils of the Universities of Glasgow, Aberdeen, and Edinburgh to discuss the question of an inclusive fee in the departments of medicine and applied science held recently in Perth, the following resolution was adopted:

> That, having considered the memorandum of resolutions adopted at the conference of representatives of the University Courts of St. Andrews, Glasgow, and Aberdeen on June 20th, 1912, and the report of the subcommittee of the General Council of the University of Glasgow, the conference finds that, while not opposed to the principle of an inclusive fee for university courses in medicine, further inquiry is necessary into the amount of the fee and into the form the regulations must take to protect the interests of the universities and the extramural schools.

UNIVERSITY OF WALES.

An examination for a registrable Diploma in Public Health is to be held for the first time next December. The names of candidates must be submitted to the University Registrar, Cathays Park, Cardiff, not later than November 15th, and the examination will begin on December 16th. The regulations concerning it closely correspond with those of other like bodies. The examination is in two parts, the fee for each of them being 6 guineas. The Act empowering the university to grant registrable diplomas in public health was obtained in December, 1911, and recognition of the diploma was accorded by the General Medical Council last June, and made retrospective.

UNIVERSITY OF EDINBURGH.

The following candidates have been approved in the subjects indicated:

First M.B. *Chemistry.*—G. B. Brewster, S. L. Dmitrieff, J. A. C. Guy, J. B. Hanna, Jeannie J. Harper, F. J. Hauptfleisch, P. W. Lam, Marjorie I. S. M'Gregor, J. P. D. Maclagan, Bessie M. Mactaggart, H. G. H. Maxwell, J. S. Rao Pandit, M. Talaat, E. T. N. Taylor. *Physics:* H. Anderson, W. E. Canekeratne, Eva M. Clark, H. B. Dykes, J. Gunn, K. C. Jaidka, S. N. Kaul, P. W. Lam, Marjorie I. S. M'Gregor, A. W. Mackie, A. Maja, S. A. D. Naoroji, D. A. Sprott, G. W. G. Sutherland, P. Vertannes, D. F. Thompson. *Botany;* J. G. L. Brown, W. E. Canekeratne, D. Colombos, P. W. Edwards, N. M. Gokool, K. C. Jaika, N. Jennings, D. W. M'Lean, A. J. Muirhead.

Second M.B. *Anatomy.*—R. C. Aitchison, R. Andrew, T. C. Bowie, J. E. Chow, I. A. Clarke, D. S. Falconer, A. J. Ferguson, F. J. Ng-a-Fook, A. W. Forrest, J. Hepburn, O. D. Jarvis, E. B. Kelley, D. Lennox, A. J. E. G. Lim, H. H. Lim, J. G. Louden, C. F. Maclachlan, P. C. MacRae, R. W. H. Miller, S. N. Mitra, J. J. Molyneaux, R. Power, P. V. Ramanamurty, V. A. Rankin, A. A. Watson, C. J. Young. *Physiology:* M. H. Alikhan, Dorothea I. Baird, T. Y. Barkley, H. J. Bruwer, W. M. Christie, F. A. Correa, J. Dale, M.A., J. C. Dobson, R. B. Ead e, A. J. Ferguson, W. H. Ferguson, E. L. Galgut, Helen M. Gall, W. Goldie, H. Jackson, Muriel H. Kerr, N. B. Laughton, A. R. Laurie, E. Law, J. Lawson, T. J. Lloyd, Margaret M. M'Garrity, I. C. Mackay, R. M'Kinlay, J. M'Leman, J. W. Malcolm, C. E. Meryon, S. N. Mitra, W. T. Patterson, J. S. Rankin, C. B. B. Reid, W. Shanks, H. S. Smith, L. J. Spence, M. Stewart, T. M. J. Stewart C. H. Wan, J. S. Webster, L. H. Werden, J. D. Whitfield, W. Williams.

Third M.B. *Materia Medica.*—R. G. Bannerman, M.A., E. G. von B. Bergh, W. Bird, J. V. Buchanan, J. S. Crichton, Georgina E. Davidson, S. J. A. Laubscher, E. Llewellyn, W. H. M'Granahan, Jessie A. MacLaren, R. H. H. Newton, B.A., G. S. Pirie, E. G. C. Price, E. A. Seagar, H. J. Simson, J. Z. Truter, J. B. Young.

UNIVERSITY OF GLASGOW.

The following candidates have been approved at the examinations indicated:

First M.B., Ch.B. (B., Botany; Z., Zoology; P., Physics; C., Chemistry).—G. W. Allan (B., P.), A. B. Austin (B., P.), *J. W. W. Baillie (B., P.), W. Baird (C.), *J. E. Bannen (B., P.), W. Barras (C.), J. Beveridge (Z., C.), M. N. Bhattacharjee (Z., C.), T. Blackwood (Z., C.), R. M. S. Boyd (B., P.), J. P. Broom (B., P.), A. C. Brown (B.), H. D. Brown (B., P.), J. A. Buchanan (B., P.), S. E. A. Buckley (B., P.), D. Campbell, M.A., B.Sc. (B., Z.), T. W. Carstairs (C.), T. C. Christie (B., P.), D. Clyde (B., P.), D. H. Coats (C.), W. K. Connell (C.), A. S. Cook (C.), *A. J. Copeland (B., P.), J. Crerar (B., P.), J. N. Cruickshank (B., P.), R. Cunningham (B., Z., P., C.), A. Dick (B., P.), J. H. Dobbin (B., P.), J. F. Duthie (B., P., C.), K. H. Dyke (B., P.), S. N. Dykes (B., P.), J. Ewing (B., P.), B. W. H. Fergus (B., P.), F. E. Ferguson (P.), J. B. Fisher, (B., Z., P.), L. L. Fotheringham (B., P.), *A. D. Gibson (B., P.), K. J. A. Gillanders (B., P.), P. F. A. Grant (C.), *T. Gray (B., P.), W. Guy (B.), A. Harper (B., Z.), W. E. Haydon (B., Z.), F. W. Hebblethwaite (B., P.), S. J. Henderson (B., P.), J. C. Hendrie (B., P.), H. F. Hollis (B., P.), J. N. Jamieson (P.), O. Johnston (C.), S. Johnstone (B., P.), A. Kennedy, M.A. (B., P.), J. Liddell (B.), F. C. Logan (B., P.), W. W. Lundie (B., P.), K. M'Alpine (B., P.), H. E. M'Coll (B., Z.), W. R. M'Crae (B.), J. R. M'Crindle (B., P.), E. Macfarlane (B., P.), A. M'Gowan (Z.), A. M'C. Macintosh B., P.), D. B. M'Intosh (C.), J. E. MacIntyre (B., P.), N. Mackillop (B., P.), J. M. Mackintosh (Z., C.), D. M'Laren (Z.), *G. Maclean (B., Z.), J. W. Maclean (B., P.), P. D. MacLean, M.A. (B.), J. Macleod (B.), P. M'Luskie (B., P.), A. F. M'Millan (B., P.), F. K. Macmillan (B., P.), W. M'William (B., P.), F. R. Martin (C.), A. M. Millar (P.), G. M. Millar (B., C.), D. S. Mitchell (B., P.), W. W. Morrison (Z.), J. Orr (C.), W. M. B. Orr (B.), J. A. Paterson (P.), J. W. Patterson (B., P.), G. Pearson (B., P.), A. C. Philps (B., Z., P.) J. Prentice (B., P.), *T. J Quigley (B., P.), J G. Rennie (Z.), S. M. Riddick (B., P.), A. W. Ritchie (B., C.), I. M. Robertson (B., P.), K. M. Rodger (B., Z., P., C.), R. Rodger (B., P.), F. J. G. Rolland (B., P.), F. W. Sandeman (B., P.), A. M. Scott (B., P.), W. Scott (B., P.), *H. B. Sergeant (B., P.), A. W. Sinclair (B.), A. W. Smith (B., P.), *C. L. Somerville (B., P.), H. H. Spencer (B.), J Steel (B., P.), J. Steele (B., P.), A. R. Steinberg (B., P.), J. S. Stewart (B., P.), P. A Stewart (Z.), T. S. Stirling (B., P.), *A. S. Strachan (P.), H. Stuart (B.), G. C. Swanson (B., P.), J. B. Sweet (C.), D. Taylor (B., P.), C. B. Templeton, (C.), *H. W. Torrance (B., P.), J. J. Treanor (B., C.), R. N. Walker (B., P.), R. S. Weir (C.), *K. J T. Wilson (B., P.), J. T. Wylie (C.), R. Young (C.). *Women:* J. M. Alexander (B., C.), M. M. Anderson (B., P.), M. N. Blake (B., P.), W. J. Crawford (B., P., C.), *M. B. Gillespie (B., P.), M. H. Glen (B., P.), L. F. Goetz (P.), J. L. Hamilton (B., P., C.), M. C. B. Leigh (Z., C.), M. J. T. Leitch (P.), M. E. MacIver (B., P.), *L. Maclay (B., P.), M. A. M. MacLean (B., P.), E. S. Martin (C.), M. K. Mitchell (B., P.), M. M. Morton (B., Z.), M. I. T. Reid (B., P.), M. N. Robertson (P.), *J. Stalker (Z., C.), M. Watson (B.), M. M. Weir (B., Z.), *A. E. Wilson (B., P.).

Second M.B., Ch B. (A., Anatomy; P., Physiology; M., Materia Medica and Therapeutics).—I. Abdurahman (P., M.), G. K. Allan (A., P., M.), J. M. Anderson (A., P., M.), J. Anderson (M.), R. Armstrong (A.), A. D. Blakely (M.), W. E. Boyd, M.A. (A., P.), M. S. Bryce (P.), J. Buchanan (M.), W. E. A. Buchanan (A., P.), J. Cameron (P.), J. Campbell (A., P., M.), J. M. Campbell (A., P.), *A. M. Clark (A., P.), A. L. B. Clark (M.), R. Clark, M.A. (M.), A. Climie (A., P.), W. Combe (A., P.), J. P. Crawford (M.), W. Cullen (A.), F. V. Daeblitz (M.), W. Donald (M.), T. I. Dun (A., P., M.), D. Ferguson (P.), T. Ferguson (A., M.), H. T. Findlay (A., P.), J. J. Finlay (A., M.), G. Fleming (M.), I. M. Frazer (A., P., M.), W. W. Galbraith (A., P.), L. W. Gemmell (M.), A. J. Gibson, M.A. (P., M.), J. Gilchrist (P., M.), P. Gordon (P.), *R. T. Grant (A., P.), R. M. Greig (M.), D. C. Hanson (M.), D. Hardie, M.A. (M.), *J. W. P. Harkness, M.A. (A., P., M.), R. Isbister (A., P.), *A. C. Jebb (M.), D. B. King (P.), J. C. Knox (A., P.), R. M. Lang (A., P.), *G. M'Callum (P.), H. D M'Crossan (A.), A. M. M'Cutcheon (A., P.), R. W. MacDonald (M.), D. M'Intyre (M.), D. M. M'Intyre (M.), J. M. Mackay (A., P.), D. Mackie (A., P.), R. H. M'Killop (M.), J. A. MacLean (A.), E. J. MacPhail (P.), J. K. Manson (M.), A. P. Martin (M.), W. J. May (M.), W. Meikle (M.), P. Nath (A., P.), J. R. Pate (M.), J. Paterson (P., M.), J. M.

Pinkerton, B.Sc. (M.), J. S. Prentice (M.), W. B. Primrose (A., P.), H. Quigley (A., P.), F. P. Rankin (M.), T. F. B. Reid (M.), R. C. Robertson (A.), A. F. Ross (A.), A. Scott (A., P., M.), *S. C. Shanks (A., P.), *W. F. Shanks (A., P.), J. Smith, M.A. (A., M.), N. M. Smith (M.), J. B. Steven (A., M.), J. F. Steven, M.A. (A.), J. S. Stewart (M.), *B. S. Strachan (A., P.), R. Tennent (M.), C. R. T. Thompson (A., M.), J. Vallance (M.), J. Walker (A., P.), W. S. Wallace (M.), W. J. C. Watt (M.), J. B. Williamson (M.), J. G. Wilson (P., M.), T. M. Wilson (M.), A. Young (A.), G. Young (M.), J. M. Young (P.). *Women:* G. G. T. Anderson (M.), E. W. Gompertz (A., P.), J. F. Henderson (P.), G. Montgomery (M.), M. Walker (A.), G. B. Whish (A., P.), I. H. Younger (A., P.).

THIRD M.B., CH.B. (P., Pathology; M., Medical Jurisprudence and Public Health).—A. M. Blackwood (M.), J. S. K. Boyd (P., M.), J. J. Burke (M.), J. Cameron (P.), W. L. Cassells, B.Sc. (P.), T. M. Crawford (M.), W. T. Currie (P., M.), J. Dunbar (P., M.), J. B. Fotheringham (M.), A. R. H. Geyer (M.), I. D. Grant (P., M.), J. W. W. Hewitt (P., M.), T. C. Houston (M.), J. R. C. Mackintosh (P.), R. M. M'Minn (M.), E. S. Macphee (M.), W. S. Martin, M.A. (M.), O. H. Mavor (M.), T. A. O'Brien (P.), R. Parker (P.), A. M. Ramsay (P.), D. R. E. Roberts (P., M.), S. D. Robertson (P., M.), H. Stewart, M.A. (P.), R. Stewart (P., M.), W. B. Stewart (P., M.), I. D. Suttie (M.), E. N. Thomson (P.), J. C. Walker (P.), H. C. Watson (M.), W. H. N. White (P.) *Women:* C. S. T. Anderson (P.), J. R. Anderson (M.), M. J. Brown (M.), E. Crawford (M.), M. P. Hislop (M.), A. R. M'Kail (M.), S. A. J. Rankine (M.)

FINAL.—J. J. Lowell, S. Blumenfeld, C. Brash, A. Brown, W. Brown, J. S. Buchanan, J. W. Burton, J. H. J. V. Coats, *Jane M. Davidson, *J. H. Dible, J. Dickie, *W. B. Drummond, J. M. Forsyth, J. E. Fyfe, A. M. Gibson, Maggie L. Kirkwood, R. A. Lennie, J. R. M'Curdie, C. A. M'Guire, G. D. M'Lean, *J. M. Macpherson, *T. Martin, K. D. Murchison, A. Peden, J. F. Quigley, *D. W. Reid, J. R. R. Ritchie, A. L. Robertson, E. Robertson, *J. H. Robertson, J. I. Robertson, F. Shearar, J. F. M'G. Sloan, *A. R. B. Soga, G. Stevenson, R. Stewart, W. P. A. Stewart, *W. Taylor, J. C. T. Teggart, Janet M. Walker, G. M. Whish, F. J. Whitelaw, T. Whitelaw, W. F. Wood.

* Passed with distinction in one or more subjects.

UNIVERSITY OF BIRMINGHAM.

Professors Malins and Priestley Smith.

AT the last meeting of the Council, the resignation of Dr. Edward Malins as Professor of Midwifery and Diseases of Women was reported, and the following resolution was unanimously passed thereon:

That the Council accepts with great regret the resignation of Dr. Edward Malins as Professor of Midwifery and Diseases of Women, and begs to tender to him its best thanks for the valued services which he has rendered to the medical school during the eighteen years in which he has occupied the chair. The Council also desires to express to Dr. Malins its warmest thanks for the generous donation of £1,000 to the university funds with which he has signalized the termination of his official connexion with the the university.

Subsequently the resignation of Mr. Priestley Smith as Professor of Ophthalmology was received and acknowledged in the following terms:

That the Council accepts with great regret the resignation of Mr. Joseph Priestley Smith as Professor of Ophthalmology, and begs to tender to him its thanks for the distinguished services which he has rendered to the medical school during the fifteen years in which he has occupied the chair.

UNIVERSITY OF BRISTOL.

THE following degrees have been conferred:

M.D.—G. W. J. Brasher; V. B. Green-Armytage.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.

A QUARTERLY council was held on October 10th, 1912, the President (Sir Rickman Godlee) in the chair.

The late Mr. Clinton Thomas Dent.

The following resolution was passed by the Council:

That the Council hereby express their deep regret at the death of their colleague, Mr. Clinton Thomas Dent, whom they highly esteemed for the energy and ability which he displayed in all matters to which he put his hand, and whose judgement and keen interest in the affairs of the college they greatly appreciated.

For these reasons, as well as for his attractive personality, the Council believe that his loss will be long felt and deeply regretted in the large circle of friends which his many interests and versatility gathered round him.

That a copy of this resolution be forwarded to Mr. Dent's relatives, and that the sincere sympathy of the Council be expressed to them in their bereavement.

The President reported that the vacancy in the Council occasioned by the death of Mr. Dent would be filled up at the annual meeting of Fellows in July, 1913. It was arranged to hold a special Council meeting on October 17th, 1912, to elect a vice-president in place of Mr. Dent.

Mr. John Marle.

The President reported that Mr. John Marle had recently died of pneumonia. Mr. Marle had been "articulator" at the college since 1865, and had, during his long period of service, carried out a large amount of valuable work in connexion with the osteological portion of the museum.

Annual Meeting of Fellows and Members.

A draft copy of the annual report, to be presented to the above meeting on Thursday, November 21st, 1912, was submitted to the Council.

Jenks Scholarship.

Mr. Graham S. Wilson, till lately a student at Epsom College, was appointed to the above scholarship.

CONJOINT BOARD IN IRELAND.

THE following candidates have been approved at the examination indicated:

FIRST COLLEGE.—J. H. Barrett, S. H. Berwitz, J. J. Campbell, B. J. Daunt, R. D'Alton, Miss E. M. Lloyd Dodd, C. K. T. Hewson, E. T. McElligott, T. Moore, P. O'Connell, I. Sharpe.

SOCIETY OF APOTHECARIES OF LONDON.

THE following candidates have been approved in the subjects indicated:

FIRST HALL.—(*Chemistry*) H. C. C. Hackney. (*Anatomy*) A. U. L. Bennet, C. H. Fischel, H. C. C. Hackney, N. Hoffmeister, J. Lyon, R. H. Pettersson, J. E. Pickering, W. F. W. Sim, R. A. Wilson. (*Physiology*) C. H. Fischel, N. Hoffmeister, S. B. King, J. Lyon, R. H. Pettersson, J. E. Pickering, W. F. W. Sim, R. A. Wilson.

Public Health AND POOR LAW MEDICAL SERVICES.

DISTRICT MEDICAL OFFICERS AND SUPERANNUATION.

VORTEX, who is a district medical officer, 60 years of age, with twelve years' service, asks if he can now resign on pension, or whether he must hold office till he is 65 to enable him to claim it.

*** Our correspondent must remain in office till 65 years of age, unless previous to that time he becomes incapable of discharging his duties efficiently in consequence of permanent infirmity of body or mind or old age.

Obituary.

DR. E. MELLOR LIGHT of Ebury Street, London, S.W., died of septic infection at Cromer on October 1st after a comparatively short illness. Dr. Light won an exhibition in natural science at St. Thomas's Hospital in 1879, but shortly afterwards went up to Cambridge, where he graduated B.A. in 1883 and M.B., B.C., in 1888. He proceeded M.A. in 1887 and M.D. in 1904. He received his medical education not only at Cambridge and St. Thomas's Hospital, but also at Leeds. He at various times held the appointments of house-physician to the Brompton Hospital for Consumption, clinical assistant to the throat department of St. Thomas's Hospital, and resident medical officer and pathologist to the General Infirmary, Leeds. Dr. Light gave particular attention to the study of life assurance, and was a member of the Life Assurance Medical Officers' Association and of the corresponding international association. He had been since 1897 the chief medical officer of the Prudential Assurance Company. Dr. Light, who was only 52 years of age, married in 1901 the daughter of John James of Hurcott, Worcestershire, by whom and by two young sons he is survived. The body was cremated at Golder's Green on October 4th.

DR. JOHN KNIGHT, Medical Officer of Health for Scarborough, whose death occurred after an operation undertaken to relieve a condition of ill health from which he had suffered for several months, was born at Glasgow in 1874. He was educated at the High School and afterwards entered the University of Glasgow, where he had a brilliant career, graduating M.B., C.M., with first-class honours in 1896 and taking the Brunton prize as the first medical graduate of his year. He took the D.P.H.Camb. in 1898 and the degree of M.D.Glasg. in 1902. He became a pupil associate of the Glasgow Public Health Department and afterwards acted for a year as assistant to the Professor of Forensic Medicine and Public Health in Glasgow. Later he again became connected with the health department and was for a time on the staff of the Belvidere Fever Hospital. In 1900 he was appointed assistant to Dr. Chalmers, Medical Officer of Health for Glasgow, and five years later received the appointment of medical officer of health for Scarborough. He was also appointed school medical officer for the borough and in 1906 published an analysis of the infantile mortality of Scarborough for twenty-nine years ending 1905. He was medical superintendent of the fever and small-pox hospital, Scarborough.

Medico-Legal.

WORKMEN'S COMPENSATION.

Appendicitis or Accident.

In Lawson *v.* Weardale Steel and Coke Company (Durham, July 15th) the question was whether the applicant's husband, who had died of appendicitis, was the victim of an accident. It was alleged that while working in an abnormal place he had strained himself, and that in consequence of the strain he had developed appendicitis.

His Honour, in giving judgement, said that the necropsy showed that the deceased, a young man apparently in good health when he went to work, had died of appendicitis, a well-known disease, which unfortunately too frequently attacked people in all stages of life, and under various circumstances. The case for the plaintiff was that although it was true the man died from appendicitis, yet it was brought on or accelerated by the accident. The first step that the applicant had to take was to prove that there was an accident. Was there proof that there was any accident at all, or was it merely conjecture? The accident suggested was a strain of some muscles of the abdomen which would have caused the appendix to burst, which undoubtedly it did. The only evidence of that was that the man thought, or complained, or said that he had strained or injured his inside. That was perfectly consistent with the pain in the ordinary case of appendicitis coming on suddenly, which it generally did. Therefore, when they had the facts perfectly consistent with the disease running its ordinary course without the intervention of any accident at all and the only evidence of the accident to put it at the highest was that the man thought that he had strained himself it would be wrong for him to say that the applicant had proved the first step in the case, namely, that there was an accident. He had no doubt that the poor young man thought he had strained himself because he did not know that there was anything the matter in the nature of appendicitis. His (the judge's) view on the facts was that the young man was unfortunately attacked with appendicitis which assumed acute form, and that he died from that disease. In his opinion the deceased did not meet with any accident within the meaning of the Act.

Capacity of a One-eyed Man.

The case of Hargreaves *v.* Haughhead Colliery Company (House of Lords) raised a question of general importance—namely, if a miner loses one eye by accident and is subsequently able to resume work at full wages, is he entitled to have a declaration of liability made under which the employers will be held liable if cataract supervenes in the other eye?

It appeared that upon February 18th, 1910, the appellant sustained injury by accident arising out of and in the course of his employment with the respondents, and as a result one of his eyes had to be removed. The sheriff substitute found that on November 12th, 1910, the appellant's incapacity ceased, that he was fit to resume work as a miner, and that his wage-earning capacity was not diminished by the loss of his right eye. This decision was upheld by the Court of Session.

On appeal to the House of Lords, Lord Macnaughton said: In this case I think the injury plainly results from the loss of the man's right eye. At the time of the accident there was no sign of incipient cataract. It is not very clearly stated, but I think that is the fair result. It seems to me impossible to say that the arbitration ought to have been kept open. If a man gifted by nature with two organs of vision loses one, then to say that the arbitration ought always to be kept open on the chance of his losing the other is, I think, absurd. For these reasons I think the appeal ought to be dismissed. The other learned lords concurred.

Power Finally to End an Award.

It is important to notice that the House of Lords has now settled a point on which the English and Scottish Courts have been at variance—namely, can the county court judge keep an award open where the incapacity has ceased, but may at some future time recur?

A man was injured in the London and North Western Railway's employment on February 12th, 1909, and received compensation for a month, when he returned to work at his former wages. For nearly a year he worked without complaint, but in January, 1910, he ceased, on account of pain and nervousness. He attributed this to neurasthenia due to the accident, but the employers maintained that it had nothing to do with the accident, but was the result of influenza. After hearing, the arbitrator found as a fact that the illness was not attributable to the accident, that the man's incapacity was due to illness, and that he had completely recovered. Accordingly, he ended the compensation.

The appellant maintained, on appeal, that an award of one penny a week ought to have been made to keep the matter open. The House of Lords dismissed the appeal. The Lord Chancellor said that when the arbitrator was satisfied that the incapacity resulting from the accident had finally disappeared he could so adjudge, and thereby finally end the weekly payment beyond renewal. On the other hand he might, if he thought proper, adjudge that the weekly payment be ended until further order, or award a nominal payment to keep the matter alive. But in the present case he had found, in fact, that the man had recovered from the effects of the accident, and, accordingly, he was entitled to end the compensation.

Medical News.

Professor Metchnikoff will deliver the Lady Priestley Memorial Lecture for 1912 on "The Warfare against Tubercle," on Friday, November 29th, in the great lecture theatre of the Royal Society of Medicine, 1, Wimpole Street, Cavendish Square, at 4.30 p.m. The lecture will be given in French, and illustrated by lantern pictures. Professor Metchnikoff is delivering the lecture under the auspices of the National Health Society, of which Princess Christian is President. Members of the Society will be admitted on presentation of members' tickets. Applications for tickets for non-members, price 10s. 6d., must be made before November 29th, to the Secretary, National Health Society, 53, Berners Street, Oxford Street, W.

The Liverpool Medical Institution commenced its meetings for the session 1912-13 on October 10th, when Mr Robert Jones delivered his presidential address on the present position of the treatment of fractures. Subsequently he entertained the members at supper.

The annual meeting of the State Children's Association will be held on Wednesday next at 4 p.m. at 24, Park Lane, W., by the invitation of the Earl and Countess Brassey. The chair will be taken by the Right Hon. Sir Albert Spicer, M.P., vice-chairman.

The inaugural lecture of the winter session at the Central London Throat and Ear Hospital will be delivered by Dr. Dundas Grant on Friday, October 25th, at 3 p.m., the title of the lecture being "Some Views in Oto-Rhino-Laryngology Reviewed; Some Criticisms Criticized."

The opening meeting of the thirty-first session of the West London Medico-Chirurgical Society took place on October 4th, when the new President, Dr. G. P. Shuter, delivered an address dealing with the history of nitrous oxide anaesthesia. Earlier in the evening the Keetley Memorial Medal was presented to the out-going President, Mr. McAdam Eccles.

The Hungarian National Committee for the seventeenth International Congress of Medicine in London next year was definitely constituted at a meeting in Budapest on October 5th. In accordance with the rules of the Congress it consists of representatives of the Ministries, of the Faculties, of the Academy of Science, and of the larger medical societies of Hungary. Professor Emil de Grósz has been elected President, and Privatdocents R. Bálint and J. de Elischer and Dr. Ch. Jassniger, Secretaries of the Committee.

The latest date for sending in essays for the Hunterian Society's medal this year is December 31st. It is awarded for the best essay by a general practitioner embodying the results of his own operations. The competition is open to all registered practitioners resident within Great Britain, Ireland, and the Channel Islands, whether Fellows of the society or not. Further particulars can be obtained on application to the Honorary Secretaries, Dr. A. C. Jordan, 11, Bentinck Street, W., and Dr. O. K. Williamson, 55, Upper Berkeley Street, W.

A course of lectures and demonstrations will be given at the National Hospital for the Paralysed and Epileptic, Queen Square, W.C., during October, November, and December. Dr. C. M. Hinds Howell will give a course on the anatomy and physiology, and Dr. S. A. Kinnier Wilson on the pathology of the nervous system. Dr. James Collier will give a course on the clinical examination of cases of disease of the nervous system. The fee for the course will be five guineas, and full particulars can be obtained from Dr. Frederick E. Batten, dean of the medical school. The first lecture of the course will be given on Tuesday, October 29th, and the subsequent lectures will be given on Tuesdays, Wednesdays, and Thursdays in each week.

At Bradfield College, Berks, on October 10th, Sir William Osler opened the new science school, and afterwards addressed a large audience. It was mentioned that the sons of medical men largely predominate at Bradfield, and Sir William suggested that boys going in for the profession might spend two years working in the laboratories between the ages of 14 and 16; this would modify the science work, which is now necessary after the boy leaves school. He much opposed the name used in connexion with chemical laboratories, and trusted that "stink" would not be applied to those he had just opened, as it had prejudiced boys against taking science classes. The Head Master pointed out the healthy situation of the school; also the

new sanitary and ventilating systems that had just been completed, thus making the college one of the most up-to-date public schools in England.

THE opening meeting of the Bournemouth Medical Society was held on October 9th. The retiring president, Dr. A. C. Coles, was in the chair. Before proceeding to the business of the evening, the president referred to the great loss sustained by the death of Dr. Fred Gardner, a past president of the society, and a vote of condolence with Mrs. Gardner was passed by the members present. The president, in introducing the president-elect, thanked the members for their support during his term of office. Dr. Frank Fowler, the new president, then took the chair and read his address, A Review of Electrotherapy and Radiology. A vote of thanks was passed with acclamation. Mr. Belben showed a specimen of a fibroid uterus containing a hydatidiform mole.

THE annual dinner of the Continental Anglo-American Medical Society was held at the Hôtel Majestic in Paris on October 12th, when the chair was occupied by Sir Bertrand Dawson, K.C.V.O., Physician to the London Hospital. The following members were present: Sir Dyce Duckworth, Bart. (Honorary President), Dr. G. Sandison Brock and Dr. Welsford (Rome), Dr. Gubb (Algiers and Aix-les-Bains), Dr. Pryce Mitchell (Monte Carlo), Dr. Tribe (Cairo) Dr. C. Winchester du Bouchet, Dr. Chaussegros, Dr. Hogg, Dr. Jarvis, Dr. Koenig, Dr. Magnin, Dr. Leonard Robinson, and Dr. Turner, Honorary Secretary (Paris). The guests included Dr. Chauffard, Dr. Widal, Dr. Vaquez, Dr. Florand, Dr. Lepage, Dr. Tuffier, Dr. Barton Jacobs (New York), Dr. Castaigne, Dr. Field Robinson, Dr. Castex, Dr. Galezowski, Dr. Farcy, Dr. Lecene, Dr. Desfosses, Dr. Leredde, Dr. Léon du Bouchat, Dr. Nagle, Dr. Mignot, Dr. Wickermann, Dr. Rehfuss, and Dr. Sibbald. After proposing the toast of "The King and the Presidents of the French Republic and of the United States of America," the Chairman, in proposing "Success to the Society," laid stress on the importance of organization in modern watering-places, and, in discussing the great progress made by modern methods of diagnosis, insisted on the importance of the modern hospital, not only as an educational centre, but as perhaps the only place where a thorough and complete examination of a patient could be carried out. Dr. Jarvis replied on behalf of the society, and proposed the health of the guests, to which Professor Chauffard replied. Dr. Robinson then proposed the health of the Chairman, who had been elected an Honorary President of the society at the annual meeting. Sir Bertrand Dawson briefly replied.

MEMBERS of the medical and administrative staffs of many of the London hospitals attended a demonstration at the house of Mr. E. B. Waggett on October 15th of the "Econocooker," an apparatus manufactured in France, for which advantages are claimed as compared with ordinary methods from the point of view of economy and the retention of the nutritive value of food. Undaunted by the presence of M. Escoffier, the chef of the Ritz Hotel, Mr. Waggett, in introducing Mr. Kiechlé, who demonstrated the invention, declared the proper method of cooking to be that of the primitive savages, who made a fire in a hole in the ground, withdrew the fire, and cooked their food in the heated cavity. The principle is still applied in cooking bread in the old-fashioned brick oven, and the French apparatus applies the principle to the cooking of meat. Two pieces of iron are heated for ten minutes and then placed above and below the food to be cooked, the whole being enclosed in a close-fitting cover. Mr. H. S. Corder, the British representative of the makers, claimed that the apparatus roasted meat in what is undoubtedly the correct way, thus described in the *Encyclopaedia Britannica*—namely: "The meat at first should be placed close to a brisk fire for five minutes so as to coagulate the albumen. It should then be drawn back a short distance and roasted slowly." Owing to the rapid fall in temperature of the hot discs during the first few minutes, while the enclosed air, the cover, etc., is being heated, the meat was treated in the way described above. Emphasis was laid on the saving of trouble in attending to the cooking range by using the new apparatus, and on the fact that the only heating required is that given for ten minutes to the metal discs. Several dishes were prepared in the presence of the audience, and the food was tasted by them and apparently approved. Modified forms of the apparatus designed for hospital and military use were exhibited, and it was stated that the "Econocooker" is now on sale at the principal stores.

Letters, Notes, and Answers.

AUTHORS desiring reprints of their articles published in the BRITISH MEDICAL JOURNAL are requested to communicate with the Office, 429, Strand, W.C., on receipt of proof.

☞ *Queries, answers, and communications relating to subjects to which special departments of the* BRITISH MEDICAL JOURNAL *are devoted will be found under their respective headings.*

ANSWERS.

DR. GEO. GORDON CUMMING (Estcourt, Natal) writes: In reply to "Tubercle" (BRITISH MEDICAL JOURNAL of August 17th), the province of Natal is admirably suited for cases of tuberculous disease of lungs such as suggested. The chief point in selection of a place of residence would depend on the condition of the heart, owing to the great variations in altitude. Estcourt itself and district is well suited for cases without any marked heart condition, and living in the district can be had from about £6 per month in boarding house. I can speak from personal knowledge of several cases which have been under my care here, and will be pleased to furnish any further information desired.

TENDER HEELS.

DR. R. NIMMO WATSON (Harrogate) writes, in reply to "T. H." (September 28th): In a number of these cases which had resisted various forms of treatment I have found instant relief afforded by deep acupunctures of the heels under nitrous oxide.

SIGNIFICANCE OF WASTING.

K. S. L. writes: If "J. H." resided in South China he would know that this wasting is a common early symptom of leprosy. He does not mention whether there is anaesthesia of the skin over the affected part. The nerve trunks should be examined to ascertain if there is any thickening.

LETTERS, NOTES, ETC.

TREATMENT OF WHOOPING-COUGH.

M.R.C.S. writes: Dr. Bain asks in the JOURNAL of October 5th for a treatment of whooping-cough which will cure in ten days. Years ago, when in practice in a large town, I went through an epidemic of whooping-cough which was most distressing from the great mortality not only in my practice but in those of my neighbours. I read everything I could find, and adopted Niemeyer's treatment, as he was the only man who had a decided faith in himself. The patient was to be kept at one temperature, and nothing allowed which was likely to produce a paroxysm, such as draughts or wild play, and before each paroxysm a full dose of potassium bicarbonate was to be given. My first case coughed twenty or thirty times an hour and refused to take the medicine. I urged the mother to persevere, and in three or four days the child ran to take the medicine when she felt a paroxysm coming on; in ten days she was coughing once only in the twenty-four hours. I have never since had a case lasting beyond a fortnight when the treatment was seriously carried out.

A CORRECTION.

DR. H. D. MCCULLOCH writes calling attention to a defective sentence which appeared in his letter in the JOURNAL of October 12th, p. 999, on the chief use of the peritoneum, and which crept in through Dr. McCulloch not having had the opportunity of correcting a proof of his letter before publication. The sentence (commencing in the sixth line of the letter) should read as follows:

> On the principle of setting a thief to catch a thief, one would imagine that the economy would evolve, among its complex structures, organs that would produce battalions of minute motile cells to best deal with these enemies, instead of leaving it to a supporting serous membrane which is without any means of repelling the invaders, unless it be by becoming what has been termed a "pyogenic membrane"—the result of the inopportune destruction and death of battalions of immature leucocytes, which, in a phase of their development when non-phagocytic, happen to be lining the entire serous surfaces.

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